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SPECIAL ISSUE CONTAINING REPORTS OF THE SECOND NEW ORLEANS MEETING OF
THE AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE
AND ASSOCIATED SOCIETIES

SCIENCE

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FRIDAY, FEBRUARY 5, 1932

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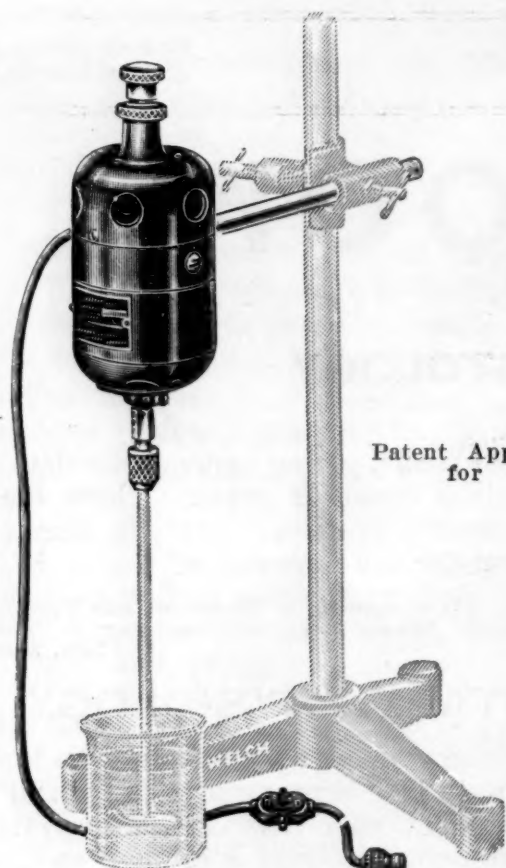
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THE NEW ORLEANS MEETING OF THE AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE AND ASSOCIATED SOCIETIES

Edited by Dr. CHARLES F. ROOS

PERMANENT SECRETARY

GENERAL FEATURES

THE eighty-ninth meeting of the American Association and associated societies at New Orleans, Louisiana, from December 28, 1931, to January 2, 1932, will undoubtedly go down in history as one of the major meetings of the association. Over 1,300 papers, many of which were of fundamental importance, were read. Scientists came from 46 states and several foreign countries. A number of societies and sections united in important symposia which should result in great scientific advances. A preliminary announcement of the meeting appeared in SCIENCE for November 27, 1931.

The local committee, headed by Dr. D. S. Elliott, of Tulane University, gave much attention to the meeting and as a result the details were competently worked out. The sessions of the association and asso-

ciated societies were very satisfactorily accommodated in the buildings of Tulane University, the Municipal Auditorium and the convention rooms of the various hotels which served as headquarters for the association and the associated societies.

The president for this meeting was Professor Franz Boas, of Columbia University. Professor Boas is known throughout the world for his important contributions to anthropology and is frequently called the dean of American anthropologists. Professor Boas gave much time and care to arranging an important symposium on "Growth" (see Section H reports) and expected to lead it, but a serious illness prevented him from attending the meeting. In the absence of Professor Boas, the senior vice-president, Dr. E. D. Merrill, of the New York Botanical Garden, became the presiding officer.

The retiring president for the New Orleans meeting was Professor Thomas Hunt Morgan, of the California Institute of Technology, eminent leader in zoological research and teaching, and a pioneer in genetics research. Professor Morgan was seriously injured in an automobile accident in the early part of October and, although convalescing nicely, was not able to prepare his retiring address and attend the meeting.

REGISTRATION

All fifteen sections of the association were officially represented on the program. Thirty-four associated and invited organizations of scientific workers joined with the association on this occasion. Altogether there were 1,372 papers read, including 109 which were read by title.

Fourteen hundred and forty-seven persons were actually registered at the association's registration offices. Many present did not register, and it is therefore impossible to tell how many attended the scientific sessions. Indications are that between 2,500 and 3,000 persons attended one or more of the technical sessions of the association or the associated societies. Each of the general evening lectures at the Municipal Auditorium was attended by over 1,500 persons. The average attendance at these sessions was about 1,700. An actual count showed that in excess of 15,000 persons entered the Science Exhibition through the main entrance. No check of those passing through two auxiliary entrances was made.

REGISTRATION AT THE OFFICES OF THE A. A. A. S. BY STATES AND PROVINCES

New Orleans	103	Missouri	60
Canada	12	Montana	4
Foreign	8	Nebraska	11
Alabama	29	New Hampshire	7
Arizona	12	New Jersey	18
Arkansas	15	New Mexico	7
California	33	New York	101
Colorado	11	North Carolina	16
Connecticut	13	North Dakota	8
Delaware	3	Ohio	40
District of Columbia ..	72	Oklahoma	40
Florida	53	Oregon	2
Georgia	23	Pennsylvania	42
Idaho	1	Rhode Island	1
Illinois	92	South Carolina	14
Indiana	35	South Dakota	3
Iowa	47	Tennessee	29
Kansas	43	Texas	137
Kentucky	13	Utah	2
Louisiana	65	Virginia	20
Maine	6	Washington	3
Maryland	18	West Virginia	2
Massachusetts	36	Wisconsin	37
Michigan	21	Wyoming	3
Minnesota	31		
Mississippi	37	Total	1,447

Many society dinners, luncheons and smokers were held, with excellent attendance.

GENERAL RECEPTION AND ENTERTAINMENT

The local committee, true to the traditions of the South, presented an unusually interesting and attractive entertainment program. Tulane University was the host at the opening reception in the Municipal Auditorium on Monday evening, following the opening general session. Well over 800 scientists and their friends attended this delightful function.

There were daily conducted tours through the Vieux Carré by competent guides who knew the intimate histories of the various landmarks in this interesting French and Spanish section of New Orleans. A delightful tea in one or two of the beautiful old homes in this section always terminated these tours. Wives of the members of the Tulane University faculty made charming hostesses on these occasions. Numerous other social functions were complimented to the various societies and sections in attendance. These are acknowledged in the section reports. Several interesting excursions, as announced in *SCIENCE* for November 20, attracted considerable interest and were highly successful. Especially noteworthy excursions were those to the Teche and Evangeline Country, to the salt mines at New Iberia, to the Bonnet Carré spillway, to the plant of the Great Southern Lumber Company and to the sugar plantations.

The association is deeply grateful to the general local committee for its efficiency in carrying out the many exacting tasks which accompany the preparations for a meeting of the association and its many associated societies and consummation. The permanent secretary has heard only praise for the general chairman and his various committeemen. The permanent secretary can not be too lavish in his praise for the splendid way in which the general local committee cooperated with his office. To the members of the general committee and the sub-committees and to the local representatives of the association sections, the American Association and all the societies that met with it are deeply and lastingly grateful. The personnel of the general committee is shown below.

THE GENERAL LOCAL COMMITTEE

ALBERT B. DINWIDDIE, *honorary chairman*.
 DANIEL S. ELLIOTT, *general chairman of local committee*.
 DOUGLAS S. ANDERSON, *first vice-chairman of local committee*.
 ANDREW M. LOCKETT, *second vice-chairman of local committee*.
 CHAUNCEY FRENCH, *chairman of special committee on finance*.
 GEORGE E. SIMMONS, *chairman of special committee on news service*.

ROBERT L. MENUET, *chairman of special committee on meeting places.*

MARTEN TEN HOOR, *chairman of special committee on reception and entertainment.*

JAMES M. ROBERT, *chairman of special committee on exhibits and equipment.*

EDWARD S. HATHAWAY, *chairman of special committee on local service.*

ROBERT W. ELSASSER, *chairman of special committee on registration and hotels.*

THE AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE PRESS SERVICE

(By Austin H. Clark, *director of the Press Service*)

Better than ever before, from the press view-point, was the material sent to the Press Service in advance of the New Orleans meeting. About half of those who were to present papers or addresses at New Orleans sent in copies of their manuscripts accompanied by abstracts, and about half of the remainder sent in abstracts.

There was a marked improvement both in the papers and in the abstracts submitted. Most of the papers and abstracts were sent in a form that left nothing to be desired. Furthermore, carbon copies of the programs of the sections and societies were available for dating the manuscripts much earlier than has been the case hitherto.

The natural result of the excellence of the manuscripts and of the prompt receipt of the programs was that it was possible for the representatives of the press to prepare a much greater amount of material than usual in Washington in advance of the meeting. This meant that more time was available for the preparation of the day-by-day accounts of the meeting, which were therefore of more than usual interest.

During the week before the meeting the office of the director of the Press Service in Washington was a very busy place. Three of the outstanding writers on science came down from New York, and five from Washington were in more or less constant attendance. The three from New York and two of those from Washington came to New Orleans.

The fact that in times such as the present the press was willing not only to pay the expense of sending the best writers from New York, Detroit, Washington and other northern cities to New Orleans, but also to send some of them to Washington in advance, shows conclusively that science news is now able to hold its own with news of other types.

The increasing attention paid to the meetings of the association by the press and by the people of the country imposes upon the association certain obligations. Every effort must be made to keep the section and society programs up to the highest possible standard. Especially valuable from the press view-point

are invited papers by outstanding men in every line of science, and symposia in which broad problems or border line subjects are discussed from several angles.

It is essential that papers of dubious value be kept off the programs. Whatever the director of the Press Service may think, his duty is to treat all with the strictest impartiality; he can not presume to act as a censor.

Forty-one manuscripts arrived too late for use in connection with the New Orleans meeting. Many of these were excellent, and had they been received in time would have been given extensive press notice. These manuscripts were at once made available to the press, and press notices of some of them will appear in the future.

It may perhaps be mentioned that the press notices of the papers submitted in connection with the meetings are by no means all confined to a single week. During the week of the meeting only a limited amount of news can be sent out. Consequently, only the contributions of more than the average popular interest can receive attention. After the meeting is over all the remaining contributions are carefully gone over and news items taken from them continue to appear for some months, originating from the town or city in which the author lives instead of from the city in which the meeting was held. In this way every item of news value contained in the papers submitted is eventually used.

Many of the abstracts sent in without the full papers in connection with the New Orleans meeting indicated that had the complete paper been submitted an interesting press story could have been prepared from it. But the abstract alone was of little or no value.

Abstracts are useful for calling attention to the main points brought out in the papers, and for giving these points clearly and concisely. But they can not take the place of the papers themselves.

The necessary brevity of an abstract renders it too inflexible to serve as a basis for an adequate newspaper account of the subject-matter. Furthermore, most of the topics discussed in scientific papers, though they may be of popular interest if properly understood, are so remote from the average individual's personal experience as to require, for their proper comprehension, more explanatory matter than can be included in an abstract.

Many of the papers presented at the meetings are so short as to be to all intents and purposes simply abstracts themselves. To be of real value to the Press Service a paper should consist of at least ten pages, exclusive of the accompanying abstract. It would be well worth while for those giving papers to be read in five or ten minutes to send to the Press Service a

manuscript about twice as long as the one which is to be read.

Each year the Press Service receives the manuscripts of a number of papers which are to be read "by title." These are sometimes of considerable interest. All such papers are considered as reports to the association and are marked for release to afternoon papers on the first day of the meeting.

The reporting of meetings would be greatly facilitated if each secretary of the sections and societies would, as soon as his program has been made up, prepare a general non-technical account of his special branch of science and send it to the Press Service. This account should be in the form of a general survey showing the present trends and indicating the advances represented by the papers to be presented.

It may be noted that nothing in regard to the papers presented at the meetings is written by the Press Service. The representatives of the press are accorded complete freedom in selecting the papers to be noticed and in writing their accounts of them. Writing for the press is a highly specialized profession, quite as specialized and difficult as the preparation of scientific papers. The function of the Press Service is to build up and to maintain a cordial feeling of mutual confidence between the members of the association and the representatives of the press. It is no part of its duties to attempt to compete with the latter.

The association was most fortunate in the choice of Assistant Professor George E. Simmons, of Tulane University, as chairman of the special committee on publicity, at New Orleans. Professor Simmons' handling of the duplicate papers sent him from Washington and of the preliminary local publicity was most effective.

The press room occupied during the meeting was excellently adapted for the work and unusually well situated, being easily accessible, and at the same time sufficiently secluded, to prevent interruptions due to unintentional intruders. The appointments of the room during the meeting left nothing to be desired.

The press representatives from outside of New Orleans who attended the meeting were: Howard W. Blakeslee, science editor, Associated Press, New York; F. B. Colton, science editor, Associated Press, Washington; Watson Davis, Science Service, Washington; Gobind Behari Lal, science editor, Universal Service, New York; William L. Laurence, *New York Times*; Leigh Mattison, science editor, International News Service, New York; Allen Shoenfield, *Detroit News*; and Dr. Frank Thone, Science Service, Washington.

It was not found practicable to present an extensive radio program in connection with the New Orleans meeting. The single radio talk, arranged for

by the Press Service and Science Service acting in cooperation, was by Professor Irving Fisher, of Yale University, who discussed "Booms and Depressions" over Station WSMB on the evening of January 1.

THE SCIENCE EXHIBITION

The city of New Orleans made the gracious gesture of providing free exhibit space in the Municipal Auditorium. It is most gratifying to be able to announce that the association was able to bring to New Orleans by far the best science exhibition in the history of the association. The fact that over 15,000 persons visited the exhibition indicates its importance and interest. U. S. government bureaus, universities, scientific research institutions and scientific societies, numbering about fifty, sent one or more scientific exhibits each. Universities represented in the exhibits were Tulane University, Louisiana State University, Columbia University, Rutgers University, the Johns Hopkins University, Rice Institute, George Washington University, the University of Illinois, Fordham University and the University of Oklahoma. Other exhibitors are listed in the general program of the meeting.

In addition to this exhibition a very successful commercial exhibition of scientific apparatus and books was held in the Venetian Room of the Hotel Roosevelt, which served also as the general registration office. Several scientific instruments and pieces of apparatus were shown for the first time. Short accounts of the exhibits of the various houses which participated in this important feature of the association's work are given in the general program for the New Orleans meeting. Afternoon coffee was served in the commercial exhibition.

The members of the special committee on scientific exhibits are: F. C. Brown, *chairman*, Smithsonian Institution Building, Washington, D. C.; Owen Cattell, *secretary*, Grand Central Terminal, New York City; Austin H. Clark, U. S. National Museum, Washington, D. C.; Burton E. Livingston, Johns Hopkins University, Baltimore, Md.; Charles F. Roos, Smithsonian Institution Building, Washington, D. C.; Sam Woodley, Smithsonian Institution Building, Washington, D. C.; local representatives, J. M. Robert, Tulane University, New Orleans, La., and C. W. Heaps, Rice Institute, Houston, Texas. The commercial exhibits were again in charge of Colonel H. S. Kimberly, director of the commercial exhibition.

To the many exhibitors who made the exhibition possible, the permanent secretary is glad to express the appreciative thanks of the association.

THE ASSOCIATION PRIZE

The ninth award of the American Association prize of \$1,000 was made on January 2 to Dr. C. C. Speidel,

of the University of Virginia Medical School, for his paper entitled "A Study of Living Nerves," presented before Section F (Zoology) and the American Society of Zoologists. This prize is awarded annually to the author of a noteworthy contribution to science presented at the annual meeting and shown in the general program. The association is able to make these annual prize awards through the generosity of a member who prefers to remain anonymous. A list of the names of those to whom the prize has been awarded is shown below, together with the topics dealt with in the winning papers.

- (1) The Cincinnati award, January, 1924. L. E. Dickson, for contributions to the theory of numbers.
- (2) The Washington award, January, 1925. Divided equally between Dr. Edwin P. Hubble, for contributions on spiral nebulae, and Dr. L. R. Cleveland, for contributions on the physiology of termites and their intestinal protozoa.
- (3) The Kansas City award, January, 1926. Dr. Dayton C. Miller, for contributions on the ether-drift experiment.
- (4) The Philadelphia award, January, 1927. Dr. George D. Birkhoff, for mathematical criticism of some physical theories.
- (5) The Nashville award, January, 1928. H. J. Muller, for contributions on the influence of x-rays on genes and chromosomes.
- (6) The New York award, January, 1929. Oliver Kamm, for contributions on the hormones of the pituitary gland.
- (7) The Des Moines award, January, 1930. A. J. Dempster, for contributions on the reflection of protons from a calcite crystal.
- (8) The Cleveland award, January, 1931. M. A. Tuve, L. R. Hafstad and O. Dahl, for contributions on the production of beta rays and gamma rays by means of high-voltage vacuum-tubes.
- (9) The New Orleans award, January, 1932. C. C. Speidel, for contributions to the study of living nerves.

The permanent secretary has prepared the following short account of the prize paper from notes supplied by the recipient, Dr. C. C. Speidel:

By a special technique, including the use of dark-field illumination, it was possible for the first time to watch directly in the living organism two fundamental activities of nerve fibers; namely, (1) the behavior of the actively moving tip of a single fiber as it grows toward the skin, and (2) the process of formation of the myelin sheath which later encases the fiber. Small frog tadpoles were used and the observations were made on the developing nerves of sensation in the transparent tail fin. While the animal was kept lightly anesthetized, a region was studied for a period of several hours. The tadpole was then replaced in pond water and the following day the same region and the same nerve fibers were again observed. In this manner the same individual fibers and

sheath cells were watched daily for as long as several months.

Experimentally, many actively growing nerve sprouts may be induced if the tip of the tail is sectioned and regeneration allowed for a few days. At the tip of each sprout is an enlargement, called a "growth cone." While at rest the growth cone is rounded and smooth in contour. In action, however, a number of extremely delicate processes are continually being extended and retracted, as if the immediate vicinity is being explored for a favorable route. The growth cone advances by a slow irregular flowing motion, spinning the nerve fiber behind it. It often displays a marked tendency to follow the fibrous processes of tissue cells which it meets.

A slight temporary obstruction in the path of the growth cone may cause a small thickening, or varicosity, to be left behind. A more formidable obstruction may lead to giant cones, or to the formation of branches. Occasionally, when an insuperable obstacle is encountered, the growth cone is pinched off, and a new cone develops, which then starts its progress in a new direction.

Following the first, or pioneer, cone of growth come the second, third and later cones, each spinning a fiber of its own. As these usually adhere to the first fiber, a small nerve is thus formed. Ordinarily these grow out in the same direction, but a few cases have been seen showing that two growth cones may migrate along a nerve in exactly opposite directions at the same time, thus passing each other. Several varieties of nerve nets, or anastomoses, have also been observed in process of formation.

Subjection of the entire animal to electrical stimulation causes no appreciable effect, either on the rate or direction of growth of active cones.

As nerve fibers become more mature, many acquire a sheath consisting of a fat-like substance called "myelin." The myelin sheath protects, nourishes and insulates nerve fibers. It is formed in segments, the first ones appearing near the nerve roots. Observations on the complete process of formation of nearly 100 myelin segments show that each segment is formed through the cooperation of a "sheath cell" and a nerve fiber. Not all nerve fibers, however, are equally ripe for myelination. Those sprouts which emerge from a myelin sheath are especially ripe for myelin sheath encasement, as soon as a sheath cell arrives.

The myelin sheath is not very stable, and under conditions involving slight injury or irritation it degenerates. Many varieties of repair and readjustment of the myelin sheath have been watched. In all these a dominating rôle is played by the sheath cells. These cells exhibit exquisite sensitivity to nearby nerve injuries or abnormalities, and respond in an appropriate way to aid in the restoration of normal conditions. Under the proper stimuli they may travel in either direction along a fiber, or transfer from one nerve to another, or multiply.

Detailed histories of the stumps of sectioned nerves reveal that several varieties of nerve regeneration may be distinguished. These records afford a reasonable basis

for the interpretation of the puzzling apparent "healing by first intention" of certain cut nerves.

BUSINESS PROCEEDINGS OF THE COUNCIL

The executive committee of the council met on Monday morning, December 28, and the council met in the afternoon of the same day. The council held other sessions on Tuesday, Wednesday and Thursday at 9 o'clock, and the executive committee held a session immediately following each of these council sessions. The following items of business were transacted:

1. A report of the committee on the place of science in education, presented by Dr. Otis W. Caldwell, chairman of the committee, was accepted. It was voted (a) that the chairman of the special committee write a story of the work done and prizes awarded for the newspapers; (b) that if possible the competition be repeated as soon as funds are available, and (c) that the association greatly appreciates the services of Dr. Otis W. Caldwell.

2. A report of the committee on source books in the history of the sciences, presented by Dr. Gregory D. Walcott, chairman of the committee, was accepted, with the expression of its gratification at the value of the work accomplished.

3. A report of the committee on popular science book lists, presented by Dr. Joseph L. Wheeler, chairman of the committee, was accepted, with congratulations to the committee, and especially its chairman, on the success of the undertaking.

4. Seven hundred and fifty fellows, nominated by the various sections and approved by the section committees, were elected as follows: A, 22; B, 44; C, 73; D, 25; E, 43; F, 98; G, 70; H, 27; I, 26; K, 10; L, 33; M, 159; N, 17; O, 63; Q, 50.

5. The prize committee for the New Orleans meeting was constituted as follows: Dr. G. H. Parker, *chairman*; Dr. H. C. Cowles, Dr. E. R. Laird, Dr. Harold Hotelling and Dr. C. C. Bass.

6. It was voted that it is impossible for the association to accept membership in the International Federation of Technical Agriculturists Associations, but an invitation was extended to the federation to hold meetings with the association.

7. Pi Gamma Mu (Social Science Fraternity) was accepted as an associated society.

8. It was voted that the meeting places for the next three years be definitely fixed, providing satisfactory arrangements can be made for the San Francisco meeting, as follows:

<i>Summer</i>		<i>Winter</i>	
1932	Syracuse	1932-33	Atlantic City
1933	Chicago	1933-34	Boston
1934	San Francisco	1934-35	Pittsburgh

9. After a discussion of policies the council voted that it favors holding the winter meeting of 1935-36 at Havana, Cuba, provided satisfactory arrangements can be made.

10. It was voted to approve the other meetings, as listed, unless unforeseen difficulties arise, as follows:

<i>Summer</i>		<i>Winter</i>	
1935	Minneapolis	1935-36	Havana
1936	Rochester	1936-37	Washington
1937	Denver	1937-38	Indianapolis
1938	Tentatively a Canadian city	1938-39	Atlanta or Houston

11. A committee was appointed to confer with the Patent, Trademark and Copyright Section of the American Bar Association, composed of the following members: Dr. F. G. Cottrell, *chairman*; Dr. Paul D. Foote and Dr. A. F. Woods.

12. The following were elected to emeritus life membership: Colonel David Alexander Lyle (M78, F80); John W. Cloud (M79, F86), and Rear Admiral Jefferson F. Moser (M79, F89).

13. The president of the association for 1932 was designated to represent the association on the occasion of the fiftieth anniversary of the Royal Society of Canada.

14. The audited financial reports of the permanent secretary and of the treasurer were accepted.

15. As a matter of information a brief history of the Hector Maiben Bequest, estimated at over \$30,000, and progress made in settlement of the estate was presented by Dr. Henry B. Ward.

16. A request of the Southwestern Division that it be allowed to name a permanent representative on the council was referred to the executive committee for consideration and report.

17. Dr. Philip Fox was elected general chairman of the local committee for the Chicago meeting, June 19-30, 1933.

18. A report of the committee on foreign guests at the Chicago meeting was made by Dr. J. McKeen Cattell. The plans include the invitation of 75 foreign guests, and provision of \$1,000 for the expenses of each.

19. Arrangements for the Atlantic City meeting in the winter of 1932-33 were discussed by the permanent secretary. He was authorized to organize the Atlantic City meeting from the Washington office.

20. It was reported by Dr. E. B. Wilson that the statisticians desired to meet with the association at Atlantic City.

21. Arrangements for the Boston meeting in the winter of 1933-34 were discussed by Dr. Karl T. Compton. The council agreed to leave these matters to be worked out by Dr. Compton and Dr. E. B. Wilson.

22. A resolution favoring the establishment of type-plant gardens of patented varieties of plants, reported from the American Genetic Association, was approved.

23. The council requested the permanent secretary to send appropriate telegrams to Dr. Franz Boas, president of the association, and to Dr. Thomas Hunt Morgan, retiring president of the association, who were absent from the meetings because of illness.

24. It was voted to change the date of the beginning of the Atlantic City meeting from December 26 to December 27, 1932.

25. Acting upon a suggestion from Captain N. H. Heck, chairman of the Secretaries' Conference, it was voted that the present method of electing fellows be suspended for one year.

26. Dr. Elder discussed the progress being made in the arrangements for the Syracuse meeting in the summer of 1932.

27. The Duren J. H. Ward project was reported to the council by Mr. Alfred Cowles, III, who reported favorably after an investigation of the project. A letter from Dr. Ward was read by the permanent secretary. After much discussion of the various policies involved, it was voted to approve the project in principle, subject to modification in details by a special committee consisting of Dr. W. B. Munro, California Institute of Technology, chairman; Dr. C. F. Roos, permanent secretary; Mr. Alfred Cowles, III, Colorado Springs.

28. It was voted to approve the expenditure of \$300, for three emeritus life memberships, \$2,000 to grantees in aid of research, and \$1,000 for the committee of one hundred.

29. The report of the committee of one hundred on scientific research, as presented by Dr. Rodney H. True, the secretary, was accepted.

30. A special committee was authorized to cooperate with other agencies in improving the broadcasting of scientific programs. Dr. R. A. Millikan was named as chairman of the committee, the remaining members to be named by the chairman of the executive committee with the advice of Dr. Millikan.

31. A resolution, approved by Section H (Anthropology), favoring the establishment of a center, or of centers, for the study of the laws of growth, mature development and senile decay from the points of view of the anatomist, the physiologist and the psychologist, was adopted.

32. Officers were elected as printed in the issue of SCIENCE for January 8, pp. 41 and 42.

THE PRESIDENT ELECT

(By W. W. Cort)

At the annual meeting of the American Association for the Advancement of Science at New Orleans, Dr. John J. Abel, professor of pharmacology at the Johns Hopkins University Medical School, was elected president of the association for 1932. Dr. Abel is the first pharmacologist to hold this office and the third representative of the medical sciences in the last thirty years, the other two being Dr. William H. Welch and Dr. Simon Flexner. Dr. Abel's position as the foremost figure in pharmacology in this country and his long and distinguished career as a teacher and an investigator make him preeminently deserving of this great honor.

Dr. John J. Abel was born on a farm near Cleveland, Ohio, on May 19, 1857. He graduated from the University of Michigan in 1883 and spent the following year in graduate study in the Johns Hopkins University. Realizing as few men in this coun-

try did at that time the need of a broad scientific training for entering the field of medicine he spent the next seven years in studying chemistry, biology and medicine in a number of leading universities in Europe. Few men have ever had such contacts with great European leaders of the medical, chemical and biological sciences. In 1888 he received the M.D. degree from the University of Strassburg and in January, 1891, he was called to the University of Michigan as professor of materia medica and therapeutics. Dr. Abel's appointment to this professorship was a very significant event in the history of pharmacology in this country, for he was the first man to hold a full-time position in this subject, free to devote his entire time to teaching and research unhampered by outside medical practice. In 1893, at the opening of the Johns Hopkins University Medical School, he accepted the professorship of pharmacology and has held that position ever since. In fact, for the first fifteen years of his work in Baltimore he gave the instruction in physiological chemistry as well as in pharmacology. With the facilities at his command he was soon able to develop a strong department in pharmacology and was early recognized as the leader in this field in the United States. Dr. Abel retires from the professorship of pharmacology at the end of the present school year at the age of seventy-four. As stated in his request for retirement this change means to him relief from teaching and administrative duties which will give him the opportunity to devote himself more intensively to his own researches. It is particularly fitting that the retirement of such an outstanding figure in the field of medical science should be marked by such a signal honor as the election to the presidency of the American Association for the Advancement of Science.

Many have been the honors that have been heaped upon Dr. Abel during the long years of his scientific activity. He is a member of the National Academy of Sciences, the American Philosophical Society and a large number of medical, pharmacological, physiological and chemical societies in this country and abroad. In 1908 he served as president of the American Society of Biological Chemists and in 1909 and 1910 was president of the American Society of Pharmacology. Honorary degrees have been conferred on him by the University of Michigan, the University of Pittsburgh, Cambridge University, Harvard University, the University of Lwow and Yale University. In 1925 he received the first award of the Research Corporation of New York. In the same year he also held the first lectureship of the Kober Foundation of the American Association of Physicians. In 1927 he received the Willard Gibbs Medal of the American Chemical Society, and in 1928 the Chemical Foundation established in his honor at the Johns Hopkins

University the John Jacob Abel Fund for Research on the Common Cold.

Important among Dr. Abel's accomplishments has been the part he has played in the organization of societies and the founding of journals. The founding of the American Society of Biological Chemists and the American Society of Pharmacology and Experimental Therapeutics was to a very large extent due to his efforts. In 1905, conjointly with the late C. A. Herter, he started the *Journal of Biological Chemistry*, which now appears in four volumes a year. In 1909 he gave up the editing of this journal and founded the *Journal of Pharmacology and Experimental Therapeutics*, which he still edits in association with Dr. Dixon of Cambridge. The high standards he has set as editor of these two journals have greatly influenced the quality of publication in these fields in the United States. In recognition of this and of his important research contributions, Volume 29 of the *Journal of Pharmacology and Experimental Therapeutics* was dedicated to him in 1926 by his friends and pupils.

It is difficult even to mention in the brief space of such an article as this Dr. Abel's research contributions to the fields of biochemistry and pharmacology. He is probably best known for his physiological and chemical studies of the products of internal secretion known as hormones. In 1895 he began work on the isolation of the hormone elaborated in the medullary portion of the suprarenal gland which has such an extraordinary action in raising the blood pressure. A number of years were devoted to this problem with the result that the active principle was obtained in the form of a monobenzoyl derivative to which Dr. Abel gave the name epinephrine. This led to the discovery of the free base, adrenaline, by Takamine. This pioneer work has been followed by literally thousands of papers by other investigators on the physiological action, chemical constitution and medical uses of this product. Later, 1906 to 1908, he succeeded in isolating the poisonous principles of the deadly mushroom, *Amanita phalloides*. Later came the period of research on vividiffusion, during which he devised a method by which the blood from a living animal can be deflected from the body, passed through a dialyzing apparatus and then returned to the body. The most recent of Dr. Abel's major achievements and in many ways the most important was the isolation of the pancreatic hormone, insulin, as a crystalline compound. This discovery not only has great medical importance, but is the first example of the isolation of an internal secretion product that must be classed with the proteins.

Important as Dr. Abel's researches have been in the fields of biochemistry, pharmacology and thera-

peutics, perhaps even a greater contribution has been his influence on the large group of investigators who have gone out from his laboratory to win distinction in many parts of the world. Many of the most important positions in the field of pharmacology in this country are held by men who were at one time his associates or students. Investigators have come from foreign countries to sit at his feet and have returned with new knowledge and enthusiasm. His efforts are, therefore, being multiplied many fold by the work of his students and his students' students.

Dr. Abel has always worked on difficult fields and has never chosen the easy, obvious lines of research. He has never followed the prevailing currents in his subject but has been the one to start new currents. He has emphasized the broadness of pharmacology, and by example and instruction has urged his students to choose their own problems and follow them wherever they might lead. His point of view has in this way broadened the whole field of pharmacology, and has emphasized constantly its fundamental relationship to chemistry and biology. Dr. Abel has never subordinated his associates and students to his own work, but has constantly urged them to find and follow out their own problems. As a technician he is probably unsurpassed in the manipulation of minute quantities of chemicals. For Dr. Abel his scientific research is not only his day's work but also his recreation and religion. He has allowed nothing to disturb the continuity of his research effort and now that he is retiring from his teaching and administrative duties he has already planned for his future investigations problems enough for a lifetime of work. So in the newly elected president of the American Association for the Advancement of Science we have not alone an eminent representative of the medical sciences, but a man who exemplifies perhaps as well as any one in the world the highest ideals of scientific research.

SESSIONS OF THE SECRETARIES' CONFERENCE

(Report from P. E. Brown)

The Secretaries' Conference and complimentary luncheon were held in New Orleans, on Monday noon, with Mr. N. H. Heck presiding. Thirty-nine secretaries or representatives and members of the executive committee were in attendance. The method of election of fellows by the association was the chief topic considered, the discussion being led by Dr. George T. Hargitt, who suggested some modifications of the present plan, in order to avoid some of the present difficulties. It was deemed necessary that the subject receive further careful study before any definite recommendations could be made, and the chairman was authorized to appoint a special committee to con-

sider the entire fellowship problem and report by June 1, 1932. The organization for the summer meetings was also discussed and the appointment of a special committee to study and report on this matter was authorized. The chairman of the conference for 1932 is Mr. N. H. Heck, secretary of Section M, and the secretary is Professor P. E. Brown, secretary of Section O.

THE GENERAL SESSIONS

The series of five evening lectures held at the Municipal Auditorium were by far the best attended lectures in the history of the association. These lectures, designed for the general educated populace of the host city and for scientists in all fields of scientific endeavor, encourage the cultivation of the broader aspects of scientific thought and the interchange of ideas between the several groups of men and women of science. Men of the highest eminence presented these addresses in non-technical language in such a way that they were of maximum benefit to laymen and scientists in other fields of work. The following brief reports are based on notes supplied by Science Service.

Dr. Richard P. Strong, of Harvard University, who gave the first of the evening lectures, declared that a tropical scourge, afflicting descendants of the Maya now living in coffee-growing highland regions of Guatemala, can be wiped from the face of the earth by surgical treatment to remove unsightly tumors and isolation of infected inhabitants who have not yet developed tumors. A single kind of fly, known as the coffee fly, which is related to the turkey gnat of the southern United States, is the intermediate host or transmitter of this disease. When a coffee fly bites a sufferer from the disease, it is infected with one stage of the worm, *Filaria onchocerca*, which causes the disease. The worm undergoes a certain development in the fly and is then passed on to a well person bitten by the fly. The plague of the fiery serpents that afflicted the Hebrews in the wilderness (chapter 21 of Numbers) was caused by the oldest known parasitic worm, *Filaria medinensis*, which is a common affliction in Bible lands and India to-day. Dr. Strong also described a number of other Filariæ.

Application of the methods of science to every-day affairs to bring the world out of its state of economic upheaval was urged by C. F. Hirshfeld, who addressed the Society of the Sigma Xi at the joint meeting with the association on Tuesday evening. He declared that in the fields that are generally designated as political, social and economic we still proceed largely upon the basis of tradition, expediency, sentiment, almost anything except determined fact. "The blame for such a situation appears to lie directly upon the shoulders of those who have been content to use the research

method in their own narrow fields to cause world-stirring changes without giving thought to the collateral products of their work and without recognizing their responsibilities in connection therewith." Until the research method is applied to the social sciences "the world must continue to utilize one expedient after another as temporary palliatives and to be subject to frequent serious and lamentable upheavals which serve as temporary outlets for pent-up, unbalanced stresses."

Wednesday evening was given over to a memorial program to Thomas Alva Edison, who was one of the founders of the association's official journal, SCIENCE. Dr. R. A. Millikan, in speaking on Edison as a scientist, said: "During the war, when we were both engaged in Washington, I spent an evening or two with him. He was then, at the age of seventy and more, reading some of the newer books that were then appearing in the field of pure science, and asking intelligent questions about them, too. His ears were gone, but there had been no crystallizing of his mind." Dr. Karl T. Compton told about Edison's laboratory in war-time. He described several search-and-trial methods used by Mr. Edison, but concluded by saying: "It is a mistake, however, to think that all Edison's work was carried on by the search and trial method. Back of everything which he did or tried there was always an idea. The starting point was always the need of accomplishing some purpose, the second stage seemed to be the suggestion of various ways of accomplishing that purpose, and the final stage consisted in trying out these suggested solutions in as thorough and systematic a manner as possible in order to find the best." Dr. Frank B. Jewett, vice-president of the American Telephone and Telegraph Company, gave an account of some of Edison's important contributions to industry and civilization. Dr. Charles L. Edgar, president of the Edison Electric Illuminating Company of Boston, gave an appreciation of Mr. Edison, based on personal acquaintance. These tributes were printed in the issue of SCIENCE for January 15.

On Thursday evening Dr. Floyd A. Nagler, of the University of Iowa, declared that engineers, who two centuries ago first attempted to master the Mississippi, should have begun at Cairo, Illinois, where the lower Mississippi begins, and not near New Orleans, where the river nears the Gulf of Mexico. "If engineers had started at Cairo with their dikes and levees and proceeded downstream, the folly of trying to exclude the Mississippi from all the surrounding plain would have been apparent. The problem has been made one of flood protection, whereas it should be one of flood passage."

On Friday evening Professor Irving Fisher declared

that wide-spread liquidation, such as has been going on in this period of depression, does not have the intended effect of reducing debts but increases them in the sense of making every unpaid dollar more burdensome. Even the most discreet and conservative business men have greater burdens of debt forced upon them by the distress selling of enormous quantities of collateral and all other forms of securities, which deflates prices of things sold and wipes out currency. In 1925 Great Britain became bound to the United States in the sum of \$4,600,000,000 and by punctiliously keeping up interest and reduction of principal now owes \$4,425,000,000. It would seem that her debt has been reduced, but Professor Fisher contended that, due to the bloated dollar of to-day, Britain now owes us \$6,700,000,000 in terms of the dollar of 1925. Much of the present trouble can be traced to our failure to understand that money is a mechanism that can get out of order, inflations with their booms and deflations with their depressions.

On Tuesday afternoon, at a joint session of the association with the mathematical societies, the ninth Josiah Willard Gibbs lecture was delivered by Professor P. W. Bridgman, of Harvard University, on the subject "Statistical Mechanics and the Second Law of Thermodynamics." The speaker presented some very interesting interpretations of the bearing of statistical mechanics, in its present stage of development, on certain fundamental notions of physical theory. He offered a refutation of some of the contentions of Eddington and Lewis with regard to the nature of time, namely, Eddington's idea as to the increase of entropy being the determining feature in deciding the direction of time flow and Lewis's ideas on the symmetry of time in physics. The address as a whole emphasized the limitations, as well as the usefulness of the methods of statistical mechanics.

A number of important general sessions were held in the afternoons under the sponsorship of various sections. Accounts of these are given in the sectional reports of scientific sessions.

THE SCIENTIFIC SESSIONS

The following accounts of the sessions of the sections and societies¹ that met simultaneously with the American Association this year have been prepared by the permanent secretary from reports furnished by the several section and society secretaries as indicated. They are arranged according to the association sections. Several societies are shown as related to both the zoological and botanical sections, and another

¹ Officially associated organizations that are affiliated with the American Association are designated by one or two asterisks (showing that they each have one or two representatives in the association council, respectively). Other officially associated organizations are each designated by a dagger.

group is related to all sections. Reports were requested from the secretaries of all organizations shown in the general program of the New Orleans meeting, and almost all responded.

SECTION A (MATHEMATICS). **AMERICAN MATHEMATICAL SOCIETY. **MATHEMATICAL ASSOCIATION OF AMERICA

(Report from C. N. Moore and W. D. Cairns)

On Tuesday Section A joined with the American Mathematical Society and the American Physical Society in a joint program presented by leading representatives from the mathematical and physical groups. Professor G. D. Birkhoff gave an exposition of some of his recent important researches on stability and instability in physical systems. Physical systems, obeying a law of uniformity expressed by a set of differential equations, were classified as of three main types: (a) non-recurrent, (b) recurrent and (c) variational. In the non-recurrent case, illustrated by the motion of a particle in a line subject to an arbitrary law of force, the motion is always (in the sense of probability) in the immediate vicinity of the "central motions" previously defined by Professor Birkhoff, which form a recurrent set of motions. In the recurrent case, when there is an invariant integral and a closed manifold M of states of motion, a certain recurrence theorem and the "ergodic theorem," recently established by the speaker, are fundamental. The outstanding and extremely difficult problem here is to determine the type of transitivity which holds, and in particular whether a given system is strongly transitive in the sense of Hopf. The variational systems derived from a variational principle are also recurrent if the manifold is closed. Here the ergodic function $T(\epsilon)$, in which T is the least time required for any motion to pass within distance ϵ of all points of the manifold, is a fundamental notion. Distinctions between different types of variational systems are made on the basis of the rate of increase of $T(\epsilon)$ as ϵ decreases.

Dr. W. F. G. Swann discussed the relationship of the various wave mechanical theories. He maintained, in particular, that although it is customary to retain the idea of a particle electron in the language of the theory, the theory itself makes no logical use of such entities. Its story must be regarded as complete without them. A similar remark may be made as regards the photon, considered as a light corpuscle. The properties of protons and electrons, as thought of a few years ago, have become matter foreign to the future of the wave mechanical concepts; and to try to force them into a permanent place in telling the story of atomic phenomena is like trying to base the discussion of the water motions of a rough sea upon the motions of the ships which are tossed about in it.

Dr. Swann also discussed Heisenberg's principle of indetermination and the deterministic view of the universe. He pointed out that the question of whether we should describe the answers in terms of laws of causality, or partly in terms of laws of chance, is to some extent a matter of choice. It is always possible to describe any sequence of events over a finite time in terms of the laws of causality, but a description in terms of the laws of chance may be more convenient, and simpler. We must remember that we can not claim that one theory of the universe is right and all others wrong. There may be many which fit the same observed facts.

Finally, issue was taken with the customary conclusion to the effect that the laws of probability demand the so-called heat death of the universe. It was pointed out how phenomena leading to other conclusions could exist, and yet be of such a nature as to have permitted us to go through in our world exactly the mental development we have gone through. In spite of the existence of such phenomena, we could have discovered the second law of thermodynamics, could have invented the statistical theory of thermodynamics and have been tempted to extrapolate our conclusions to the belief that the phenomena in question were impossible. (See the report of Section B.)

The afternoon program was opened with the address of the retiring vice-president for Section A, Professor G. A. Bliss. This address dealt with various mathematical methods that have been used in the quantum theory, particularly those that belong in the field of the calculus of variations and related mathematical theories.

The ninth Josiah Willard Gibbs lecture was delivered by Dr. P. W. Bridgman on Tuesday afternoon. (See "General Sessions.")

The feature of the Wednesday morning program of the American Mathematical Society was the presentation of the Cole Prize in the theory of numbers to Professor H. S. Vandiver for work on Fermat's Last Theorem. He responded to the award by giving an interesting account of the advances he has made toward a complete discussion of this famous problem, which has intrigued the mathematical world for nearly three centuries.

The following officers of the American Mathematical Society were elected: *Vice-presidents*, Professor E. V. Chittenden and H. H. Mitchell; *secretary*, Professor R. G. D. Richardson; *treasurer*, Professor G. W. Mullins; *associate secretaries*, Professor M. H. Ingram and Professor T. M. Putnam; *member editorial committee of the Bulletin*, Professor W. R. Longley; *member editorial committee of the Transactions*, Professor J. D. Tamarkin; *member editorial committee of the American Journal of Mathematics*, Professor A.

B. Coble; *member editorial committee of the Colloquium Publications*, Professor R. L. Moore; *members of council*, Professors C. R. Adams, Arnold Emch, T. R. Hollcroft, C. C. MacDuffee, W. E. Milne, E. H. Moore.

On Thursday morning there was a joint session of the American Mathematical Society and the Mathematical Association of America, at which Professor E. R. Hedrick, representing the former organization, delivered his retiring presidential address, entitled "Non-Analytic Functions of a Complex Variable." The speaker first reviewed the history of efforts that have been made to extend the field of application of the classical theory of functions of a complex variable. These various generalizations include the extension to functions of several complex variables, the functions of hypercomplex number systems, the functions of variables on surfaces or in n -dimensional spaces and functions defined on special sets of points. Other forms of generalization include those that generalize the fundamental differential or integral equations that are connected with the classical theory. He emphasized that many fundamental theorems of the classical theory, such as the mean-value theorems, the Morera theorems, the Liouville theorems and theorems of certain specified types, hold good also for the functions here discussed.

On Thursday afternoon Section A joined with Section K to listen to an interesting paper by Professor E. B. Wilson and Miss Ruth R. Puffer on "Laws of Population Growth." (See the report of Section K.)

In addition to the above-mentioned special features, the American Mathematical Society held sessions on Monday morning, Monday afternoon and Wednesday morning for the presentation of contributed papers. A joint dinner for all mathematicians present was held on Wednesday evening at the Patio Royal Restaurant.

At the joint meeting of the Mathematical Association of America with the American Mathematical Society on Thursday morning, Professor R. D. Carmichael, of the University of Illinois, gave an extended summary of recent research work in the theory of numbers; this excellent paper will appear in the *American Mathematical Monthly*. The Mathematical Association also held a separate session on Thursday afternoon. Professor C. R. Sherer, of Texas Christian University, gave an account of a method for the conduct of freshman mathematics courses whereby he made manifest that there was a distinct gain in efficiency. Professor Otto Dunkel, of Washington University, extended to various integrals a process of substitution involving "proportion by composition," which is used occasionally in only one special elemen-

tary integral. Professor Dunham Jackson gave the outline of a course in Fourier Series as he has presented it to a class which combines first-year graduate students along with students who have had just one year of the calculus. This kind of a course will make possible a grasp of the method of Fourier Series at an earlier stage than is usual in collegiate or graduate mathematics. At the annual business meeting Professors W. H. Bussey and G. C. Evans were elected vice-presidents for 1932, and Professors H. E. Buchanan, W. B. Ford, E. R. Hedrick and W. R. Longley were elected members of the board of trustees for three years. Professor W. B. Carver, of Cornell University, has succeeded Professor Bussey as editor-in-chief of the *Monthly*.

SECTION B (PHYSICS). **AMERICAN PHYSICAL SOCIETY.

*AMERICAN METEOROLOGICAL SOCIETY. **AMERICAN ASSOCIATION OF PHYSICS TEACHERS

(Reports from A. L. Hughes, E. Allan Aime and Glen W. Warner.)

The meeting of Section B was presided over by Professor Bergen Davis, of Columbia University. The meeting opened with the address of the retiring vice-president, Professor F. K. Richtmyer, on "The Romance of the Next Decimal Place."

He pointed out that the ever-increasing precision with which the physicist measures physical quantities is one of the important factors in the rapid strides which physics has made in recent decades. The hunt after "the next decimal place" has not only made possible more exact statements of physical laws, but in very many instances has led to new discoveries. Tycho's accurate observations of the motion of Mars led Kepler to deduce the elliptical nature of the planetary orbits, which in turn played an important part in the establishment of Newton's law of gravitation. Foucault's accurate measurement of the velocity of light was the clinching argument for the wave theory. The relatively exact establishment of the empirical laws of black body radiation provided the foundation on which Planck built the quantum theory. Lord Rayleigh's dissatisfaction with the slight lack of agreement between the density of nitrogen obtained from the air and that prepared chemically led to the discovery of argon and other noble gases whose existence had not been suspected. Time and again new avenues in physics have been opened up as a result of increasing the precision of experimental measurements. In fact, a new discovery is so likely to result from increased precision that the physicist might adopt as his dictum, "Look after the next decimal place and physical theories will take care of themselves."

The second paper on the program of Section B was an invited address on "Solar Radiation as a

Meteorological Factor," by Dr. Herbert H. Kimball, of the United States Weather Bureau. The variations in the heat received from the sun at any one point of the earth's surface depend on several factors. The chief of these are: (1) Variations in the distance of the earth from the sun according to the time of the year; (2) variations due to solar declination, which causes seasonal variations which are small at the equator and increase rapidly as we go to the poles; (3) variations due to the changing dust content (due to volcanic eruptions) of the atmosphere; and (4) variations in the rate of emission of heat from the sun itself. Dr. Kimball reviewed the evidence for concluding that the weather changes are not brought about as the direct result of the slight changes in the solar radiation as outlined above, but are due almost entirely to the huge differences in the intensity of the solar radiation received by the earth in the equatorial and polar regions. Gravity causes the heavy cold air to displace the lighter warm air at the surface, and a polar-equatorial circulation is set up, turbulent in character, especially in winter, when the temperature differences are most marked. It is to studies of this turbulent polar-equatorial movement of air that meteorologists look for improvements in weather forecasting. It is becoming more clearly recognized that the atmospheric processes in the polar region of both hemispheres play a predominant part in determining the weather changes. The next step forward in weather forecasting will call for the establishment of well-equipped meteorological stations as far north as possible.

Dr. W. F. G. Swann, the president of the American Physical Society, chose as the subject for his presidential address, "Reality in Physics." The lecture began with a review of what constitutes an acceptable theory. One that is satisfactory to a mathematician may appear to be quite unconvincing to a certain type of physicist. To the former, the development of a scheme of mathematics in which there is a one-to-one correspondence between certain things in the mathematics and the observable phenomena of nature constitutes a satisfactory theory. The postulates of his mathematics become the laws of nature in physics. The unsophisticated physicist will not quarrel with such a theory insofar as it correlates phenomena and predicts new ones, but he may feel very dissatisfied with the absence of a model or mental picture of the processes. He demands not only that a theory should work, but that it should be reasonable. The reasonableness of the theory is associated in his mind with its reality. To him there is reality in an explanation of a physical process if he can simulate it by means of a model involving familiar things, such as wheels, springs, weights. A closer analysis, however, shows that, after all, reality is a matter of feeling; it is

something which satisfies our undefined sense of the fitness of things. The Bohr picture of clear-cut electron orbits within an atom has now been replaced by a set of rules which give the same quantitative results. Thus the theory has been stripped down to essentials, while the superimposed, but superfluous, orbit picture, which in the minds of many gave an impression of reality to the theory, has been discarded. Yet models have proved time and again of the greatest assistance in interpreting and stimulating research; it would be foolish to ban them. They should, however, be recognized for what they are; namely, stimulants to thought and not an essential part of a theory. Reality "has no existence outside your own dreams and is often no more than the reflection of your own thoughts shining on the face of nature." (See the report of Section A.)

The remainder of the program of the American Physical Society was made up of three parts. First, there was the regular program of contributed papers, in which forty-nine reports were presented. Next there were two joint meetings with Section A and the American Mathematical Society. (See the report of Section A.)

It was particularly fitting that a joint meeting of the American Physical Society and the Society of Petroleum Geologists should be held at the New Orleans meeting, for many of the successful applications of geophysics have been made in Louisiana and Texas. (See the report of Section E.)

A successful dinner of the American Physical Society and of the American Association of Physics Teachers was held at the Roosevelt Hotel on December 30.

Dr. John Patterson, president of the American Meteorological Society, discussed in a most interesting and instructive manner the methods now used in the reduction of the barometer to sea-level, and pointed out the fact that in elevated regions the corrections applied are often in error.

Mr. Harvey S. Cole presented material on his study of the droughts in Arkansas covering a 32-year period.

Mr. Lawrence H. Daingerfield discussed weather and cotton yield in Texas and in conclusion said: "It is quite obvious from this study that purely weather factors alone, which might have produced a fair or reasonably good crop in the early years, under happier conditions or better soil and fewer battling pests, may well produce an extremely short crop due to new factors or hazards at the present time."

Mr. W. F. McDonald indicated that a system of wind force terminology referring wind velocities to aircraft movement is much more desirable than the Beaufort system now used, which was designed primarily for use in connection with seagoing vessels.

Dr. Isaac Monroe Cline pointed out that under the spiral inward circulation theory, relative to the wind directions in cyclones, it is generally held that waves and swells were sent out from the cyclone center with considerable uniformity in all directions. This, however, is not true. The storm tide is built up on the coast line only directly in front of and to the right of the line along which the cyclonic center is advancing. Professor W. J. Humphreys presented two papers, "Sunshine *versus* Starshine" and "Shower and Drizzle." In the former he corrected some common errors regarding the "temperature of space," and exhibited a method for determining the absolute temperature of an object placed in space at the distance of the earth from the sun. Mr. Charles D. Reed showed that in many cases marked weather abnormalities of midwinter and midsummer persist over periods of 60 days or more, and that monthly forecasts could be made, based upon these abnormalities.

Dr. Herbert H. Kimball said that the meteorological work in connection with the polar year 1932-33 is expected to produce results of immediate practical value in forecasting weather in middle latitudes. A network of stations north of latitude 55° is to be maintained from August, 1932, to August, 1933, inclusive. Most of these will be in wireless communication with the meteorological services of the northern hemisphere, so that observations can be entered at once on northern hemisphere weather maps. A similar system on a smaller scale is planned for the south pole. The dynamical interaction between polar and equatorial air currents in middle latitudes will be studied.

Mr. Eric R. Miller presented a paper giving an account of the work being done at the German National Flying Stations. A trained meteorologist is attached to each ship to further the interests of experimental and research meteorology and to test aeronautical instruments. Thunderstorms, icing of airplanes, oxygen breathing apparatus, atmospheric electricity, aerial photography and the sports of gliding and soaring are all made subjects of special study.

Mr. Grady Norton declared that the lack of an intensive weather reporting service by teletype and radio broadcast places much of the burden of advising aviators upon the forecasters.

The annual reports of the secretary and treasurer showed that the society continued to grow in membership during the year 1931 and that it was in sound financial condition. The following officers were elected: Dr. Herbert H. Kimball, *president*; Mr. Henry B. Hersey, *vice-president*; Dr. Charles F. Brooks, *secretary*; Mr. W. R. Gregg, *treasurer*; and Mr. Robert E. Horton, Professor Alexander G. Mc-

Adie, Mr. Charles L. Mitchell, Mr. Julius M. Sherier and Mr. Melvin B. Summers, *councilors*.

The program of the first annual meeting of the American Association of Physics Teachers included discussions of three main topics: (1) "The Introductory Course in College Physics"; (2) "Research and Project Work for Undergraduates"; (3) "Special Topics." Dr. C. J. Lapp gave the plan of the correlated science course for liberal arts students at the State University of Iowa. The subject-matter consists of approximately equal amounts of physics, chemistry, botany, zoology, geology and astronomy, presented in the order named by teachers from the various departments. Professor Lapp emphasized the experimental nature of the course and the problem of proper selection of subject-matter. He recommended that such a course should take the time of sixteen semester hours.

Professor A. A. Knowlton, in describing the cultural course in general physics at Reed College, emphasized the necessity for making the course attractive and interesting, but without neglect of the fundamentals. He recommended a very liberal amount of the new physics interwoven with the classical, a unified treatment rather than the traditional subdivisions, and a normal amount of mathematics with emphasis on the physical interpretation of the formulas used.

Professor Harvey B. Lemon outlined the new physical science program of the University of Chicago and described the 200-page syllabus prepared for use of students and the museum of self-operating experiments.

The general discussions showed many conflicting opinions, but it was unanimously agreed that too much is being expected of students of general physics, and far too much subject-matter is being included. At the business session a permanent constitution and by-laws were adopted and plans were perfected for promoting investigations in physics education.

SECTION C (CHEMISTRY)

(*Report from C. A. Browne*)

Section C of the American Association for the Advancement of Science held its meetings on the forenoons and afternoons of December 29 and December 30. Owing to the resignation of the secretary of the section, R. R. Renshaw, the duties of this office were filled by the chairman, C. A. Browne. Professor C. E. Coats, of the Louisiana State University, presided over the session of Tuesday morning, and Professor H. W. Moseley, of Tulane University, over that of Tuesday afternoon. There was an average attendance of about fifty at the different sessions.

A session devoted to general papers was opened by the address of the retiring vice-president, Profes-

sor James F. Norris, of the Massachusetts Institute of Technology, upon "Research and the Development of Industrial Organic Chemistry." In the absence of Professor Norris, his address was read by Dr. C. A. Browne. A paper upon "New Aspects in the Feeding of Cottonseed Products" by Dr. H. Stevens and Dr. E. M. Nelson, of the U. S. Bureau of Chemistry and Soils, was read by Dr. W. W. Skinner. Interesting experiments upon the synthesis and isolation of Crystalline Vitamin D were described by Dr. C. E. Bills and Dr. F. G. McDonald, of Mead, Johnson and Co. New information upon the crystalline forms of glycine was presented by Dr. T. S. Eckert, of Birmingham-Southern College. An improved method for making spontaneous emulsions for insecticidal purposes and a new analytical procedure for determining the mineral oil on leaf surfaces after spraying were described by Dr. L. H. Dawsey, of the U. S. Bureau of Chemistry and Soils. An account of chemical observations in foreign lands, illustrated by lantern slides, was given by Dr. C. A. Browne.

The program for a session devoted to a symposium upon "Recent Developments in Some of the Agricultural Chemical Industries of the South" comprised papers by Dr. Gipson Carter, of Louisiana State University, Dr. S. A. LeCroy, of Louisiana State University, Dr. F. H. Thurber and Dr. H. S. Paine, of the U. S. Bureau of Chemistry and Soils, Dr. C. F. Walton, Jr., of the U. S. Bureau of Chemistry and Soils, Dr. F. P. Veitch, of the U. S. Bureau of Chemistry and Soils, Dr. David Wesson, of Montclair, N. J., and Dr. R. H. Stevens, of the Bogalusa Paper Company. The contributors to this symposium called attention to the vast number of possibilities awaiting development in the chemical industries of the South, such as ramie, sweet potato, starch, sirup, naval stores, cottonseed and paper manufacturing. The papers awakened a wide discussion among the members of the section.

Two sessions were devoted to a symposium upon "Some of the Normal and Abnormal Components of the Atmosphere." Contributions to this symposium were made by Professor J. Willard Hershey, of McPherson College (with a 12-minute film); Dr. W. J. Humphreys, of the U. S. Weather Bureau; Dr. J. E. Ives, of the U. S. Public Health Service; Dr. W. W. Skinner and Dr. S. W. Griffin, of the U. S. Bureau of Chemistry and Soils, and Mr. R. W. Frey, of the U. S. Bureau of Chemistry and Soils. There was a general discussion upon the biological, agricultural, industrial and economic significance of various components of the atmosphere. The enormous losses which are produced annually in the United States by gaseous and other pollutions of the atmosphere were particularly emphasized, and it was the general opinion of the section that the problem of curtailing

these losses and the injury to public health and to plant and animal life was one of outstanding importance.

On Thursday afternoon Section C joined with Sections I (Psychology) and N (Medical Sciences) for a symposium on "New Methods of Approach to Problems of Mental Disorders." (See the report of Section N.)

SECTION D (ASTRONOMY)

(Report from Philip Fox)

The American Astronomical Society held a meeting in Washington from December 28 to 30. This meeting was followed by a meeting of the American Section of the International Astronomical Union in preparation for the first American meeting of the Union in 1932. The attendance of astronomers in New Orleans was therefore small; only a score were present at the one session of Section D to discuss the seven papers presented.

Mr. M. R. Ensign and Dr. B. F. Dostal contributed a preliminary paper toward the interpretation of the complex record of temperature, barometric pressure, direction and location of storm tracks, attempting to associate them with sunspot phenomena, planetary periods and lunar declinations.

Dr. H. T. Stetson continues his investigation of the relation of solar activity and intensity of radio reception. With a 50 per cent. diminution of spot numbers, the intensity of radio signals has increased 400 per cent. This is interpreted as due to change of level of the Kennelly-Heaviside layer in response to electronic emission from the sun as modified by the fields of sun-spots.

Mr. Richard Zug and Dr. D. W. Morehouse have investigated the Dark Ring configuration in the Labrador region of the North American Nebula on plates made at the Drake Municipal Observatory. From counts which include 3,373 stars within, on and about this ring they find evidence of absorbing clouds at the levels of the 11.5 and 15.5 magnitude stars.

Observations from many stations on the brilliancy of the advance guard of the Leonid meteoric shower in 1930 and 1931 indicate a prospect for a rich display in 1932. Dr. C. C. Wylie and assistants from three stations at the corners of a triangle, roughly thirty miles on a side, on November 17, observed meteors at the rate of two per minute per person and obtained data for derivation of the paths. Similar teams organized for observation in November, 1932, should obtain valuable results.

Many stars of class B_e show emission lines of singly ionized iron. Because the ionization and excitation potentials of iron are low, Otto Struve examined on Yerkes Observatory spectrograms of B_e stars the lines of other elements of comparatively low ionization and excitation potentials. He found emission

lines of ionized magnesium, silicon and other elements. He further made some interesting observations on the width of the emission lines as follows:

	H	F II	Mg II
Chi Ophiuchi	2.5 A	4.1 A	5.7 A
Gamma Cassiopeiae	3.9 A	4.5 A	6.6 A

He concludes that the broadening is due to the rotation of stratified shells or rings of gas about the star, the lines of greater width having origin in lower rings moving, in accordance with Kepler's laws, at higher speeds.

A paper by Mr. C. S. Beals described a new photoelectric microphotometer built at the Dominion Astrophysical Observatory. It is a direct reading instrument, sensitive, flexible and for many purposes faster and more convenient than the self-registering types. The sensitivity can be varied and can be made to give a deflection of 50 mm on the galvanometer scale for the smallest difference of density clearly perceptible to the eye. Curves of the Wolf-Rayet band at 4686 in the spectrum of HD 192163 revealing a complex structure and curves of contours of the inter-stellar calcium lines of 9 Camelopardalis show the accuracy and range of applicability of the instrument.

The final paper was a report on the W. J. McDonald Observatory to be established under the trusteeship of the Board of Regents of the University of Texas. The \$800,000 available as of April, 1930, may be allowed to accumulate or be used in immediate construction. Any part of the sum may be used for endowment. Action will be deferred until the advice of eminent astronomers has been secured. Meanwhile thorough tests of promising sites will be conducted. The site must not necessarily be in Texas but preferably so. Present opinion seems to be to proceed with construction when type of observatory equipment and its site are determined.

The address of the retiring vice-president, Dr. D. W. Morehouse, presented at a general assembly, has been printed in full in SCIENCE for January 8.

SECTION E (GEOLOGY AND GEOGRAPHY). **GEOLOGICAL SOCIETY OF AMERICA. SOCIETY OF PETROLEUM GEOPHYSICISTS

(Reports from Kirtley F. Mather and John F. Weinzirl)

Section E held two sessions on Friday, in conjunction with the Geological Society of America. None of the other associated organizations related to this section were in session in New Orleans, and the principal meeting of the Geological Society of America was held in Tulsa, Oklahoma, from December 29 to 31, but about fifty geologists and geographers attended the joint sessions in New Orleans and ten papers were listed on the program. Professor Douglas Johnson,

of Columbia University, vice-president for the section, presided. The address of the retiring vice-president, Professor Edson S. Bastin, of the University of Chicago, was presented at the afternoon session. It dealt with the types of copper deposits low in sulphur and iron. Abstracts of all papers presented will be published in the March issue of the *Bulletin of the Geological Society of America*.

About thirty of the geologists and geographers who were present in New Orleans gathered at Galatoire's for dinner on Friday evening. An unusually interesting feature of the New Orleans meeting was the field trip to the salt domes and mines of the Teche country. The party left New Orleans on Friday evening and spent much of Saturday in the field. The thanks of all in attendance are due to Professor Steinmayer and his colleagues for the excellent arrangements which they had made for the technical sessions and the field trip.

A joint meeting of the Society of Petroleum Geophysicists, American Physical Society and Section E was held on Wednesday afternoon.

Under the able guidance of Dr. Eckhardt the meeting developed into a happy combination of theoretical and practical discussion of different matters presented. Discussion brought forth by Dr. Donald C. Barton, Dr. E. E. Rosaire and Mr. Eugene McDermott painted a vivid picture of the immediate commercial application of geophysics in oil field exploration. A noteworthy theoretical paper was presented by Mr. Maurice Ewing, entitled, "Earth-Amplitudes in Seismic Prospecting." Papers showing much study on the accumulated data of the last years of commercial geophysical exploration were presented by Dr. H. A. Wilson, Mr. F. A. Snell, Mr. H. Rutherford and Dr. M. M. Slotnick.

The meeting reflected the beneficial effects of the protracted session in helter-skelter geophysical exploration of late years. Time has been allowed those in the commercial world to rework accumulated data, devise new formulae, improve upon instrument construction and, of greatest importance, improve upon the interpretation of existing information in hand for better evaluation of future work.

SECTION F (ZOOLOGICAL SCIENCES). **AMERICAN SOCIETY OF ZOOLOGISTS. **ENTOMOLOGICAL SOCIETY OF AMERICA. **AMERICAN ASSOCIATION OF ECONOMIC ENTOMOLOGISTS. **AMERICAN SOCIETY OF PARASITOLOGISTS. †WILSON ORNITHOLOGICAL CLUB

(Reports from Wm. H. Cole, J. J. Davis, A. F. Burgess, Norman R. Stoll, and Jesse M. Shaver)

The American Society of Zoologists held sessions for the reading of papers on Tuesday morning, Wednesday morning and Wednesday afternoon. Exclu-

sive of joint sessions and the invitation program, fifty papers were read, distributed as follows: physiology, 34; embryology, 4; cytology, 6; protozoology, 2; miscellaneous, 4. Six papers were contributed to the joint session with the American Society of Parasitologists, and two to the session with the Ecological Society of America on Tuesday and Wednesday mornings. Tuesday afternoon was devoted to the informal presentation of fourteen demonstrations and exhibits. One hundred and four other papers were presented by title only. At the regular sessions the attendance was good, over one hundred being present at the Tuesday morning session on physiology, and from 35 to 75 at the other sessions. All the above sessions and demonstrations were held at Tulane University, where the appointments and facilities were excellent. Invitational research papers were presented on Thursday morning in the Municipal Auditorium by Dr. C. E. McClung, Dr. G. H. Parker, Dr. H. V. Wilson, and Dr. F. R. Lillie. This session was highly successful, with over 150 in attendance. In the afternoon a joint session with the American Society of Naturalists was held in the same room and was also well attended.

On Friday an eight-hour field trip to the Pearl River region, northeast of New Orleans, was conducted for zoologists by the departments of botany and zoology, of Tulane University. An instructive mimeographed booklet describing topographical and ecological features of the regions visited and a long list of the fauna and flora was given to each of the 50 people taking the trip. Undoubtedly some zoologists participated in the same trip on Thursday for the ecologists.

On Wednesday evening the zoologists' dinner was held at Kolb's restaurant, with 166 participating. The menu cards were written in Latin, and during dinner a colored quartet in native costume sang plantation melodies, greatly enjoyed by all. The after-dinner address was given by the retiring vice-president of Section F, Dr. Robert W. Hegner, on "How the Other Half Live." This will appear in *SCIENCE*. After the address a resolution was unanimously approved, expressing the thanks and appreciation of the society and of Section F to the members of the local committees, and others in New Orleans, who had made the whole program so successful. The usual biological smoker was held on Tuesday evening.

At the zoologists' business meeting Dr. W. C. Curtis was made president, with Dr. L. V. Heilbrunn vice-president, for 1932. Twenty-five active members and 20 associates were elected. An important action was taken by the society in voting appropriations of \$500 to *Biological Abstracts* and \$200 to the Union of American Biological Societies, sponsor for the *Abstracts*. A motion was also approved to secure by

mail a vote from the entire membership on the proposition of raising the annual dues from two to five dollars, the additional amount to go to the *Abstracts*. A complete account of the proceedings of the society will appear in the January number of the *Anatomical Record*.

The Entomological Society of America held its twenty-sixth annual meeting on Tuesday and Wednesday, with 28 interesting papers covering nearly every field of entomology, and in addition, a symposium and the annual address. The annual invitational address by Mr. F. C. Bishopp, on "Waging War on Insect Enemies of Man and Animals," was given before a large interested audience. The symposium entitled "Blood-Sucking and Non-Blood-Sucking Flies in Relation to Human Welfare" was excellently presented by Mr. F. C. Bishopp, Mr. H. H. Schwardt, Mr. E. H. Hinman, Professor W. B. Herms and Professor Ernest Carroll Faust. The following comments were made by Dr. Faust in summing up the symposium: "While the scourge to human life from the transmission of disease by insects has been greatly reduced and ameliorated since the beginning of the century, blood-sucking insects are still one of the most important sources of human disease, particularly to non-immune populations. We still have with us at one place or another on this earth malignant malaria, yellow fever, dengue, the trypanosomiasis, leishmania infections, the rickettsial diseases, the filariases, and other scourges to civilization, just as definitely as they existed two thousand years ago. In fine, insects are still one of the most important sources from which man contracts disease." The subjects on the general program included studies in insect physiology, morphology, bionomics, ecology, taxonomy, nomenclature, parasitology and some which had a direct relation to applied entomology. Dr. Emil Bogen, in a paper outside the field of entomology, strictly speaking, discussed the common and highly poisonous spider known as the "black widow," and cited many cases of fatalities from the bite of this spider. Six excellent exhibits were presented. The meetings were presided over by President J. W. Folsom. Officers elected for 1932 are: *President*, J. J. Davis; *first vice-president*, F. C. Bishopp; *second vice-president*, W. B. Herms; *secretary-treasurer*, H. B. Hungerford.

The annual meeting of the American Association of Economic Entomologists and its sections convened in the Municipal Auditorium in New Orleans. The space allotted was very satisfactory, and while the attendance was not quite as large as usual, nearly 200 members and visitors were present at the opening session. In the afternoon and on the following day three sections of the association met, and papers were read on special subjects, such as apiculture, plant

quarantine and inspection, extension entomology and research work on toxicology and insect physiology.

The reports of the officers and the various committees indicated that the Entomological Association was making progress. Eighty-five new members were elected and four were reinstated. Only three members were lost during the year by death. The total membership at the close of the meeting was 1,241. Professor W. P. Flint, of Urbana, Illinois, was elected president, and Professor A. I. Bourne, of Amherst, Massachusetts, secretary.

The seventh annual meeting of the American Society of Parasitologists was held on Tuesday, Wednesday and Thursday, under Acting President A. C. Chandler, of the Rice Institute. The program was as notable for the number of its contributors as for the interest attaching to the content of many of the reports. Of 71 classifiable papers on the society program, 12 were in entomology, 37 in helminthology and 22 in protozoology, of which half were presented in person to audiences as large as at Cleveland. The society met jointly with the American Society of Zoologists on Tuesday morning, and with Section N in the afternoon for an invited symposium "On Parasitology of Medical Interest." The Tuesday afternoon session of invited papers was participated in by Drs. R. Hegner, W. E. Dove, C. W. Stiles, P. D. Lamson and G. F. Otto, with topics, respectively, on amoebiasis in Panama, the transmission of endemic typhus, control of hookworm disease in the United States under present conditions, the chemotherapy of the common intestinal helminths of man, and roundworm and whipworm infestations of man in the southern United States. On this program the discussions were initiated by several designated specialists. (See the report of Section N.) On Tuesday evening the society held its first annual dinner, at which over 50 persons dined on Creole food at its best, following which Dr. A. C. Chandler gave an address on "Susceptibility and Resistance in Helminthic Infestations." Dr. Chandler's address summarized the findings in this rapidly growing division of interest in parasitological research and gave added point to many of the angles of the problem of resistance to nematode infestations by illustrations from recent unpublished work in his own laboratory. Wednesday morning's session, largely zoological in character, was matched by a program on Thursday morning, largely medical in interest, with a demonstration period on Wednesday afternoon. Among the subjects considered were insects as intermediate hosts of various helminthic parasites, the life history of a blood-inhabiting protozoan of ducks with a biting fly as vector, coccidiosis of chickens and rats, ciliates of guinea pigs, a pathogenic nematode of pigeons, abnormalities of parasitic flat worms, variations in one of the amoebae of man as

revealed in a long series of consecutive examinations from one parasitized host, the transmission of intestinal protozoa of man by flies and other potential vectors, a puzzling flagellate group of parasitic protozoa in man, recent studies of hexylresorcinol as an anthelmintic, the relation of diet to susceptibility in dogs to the canine hookworm, the effects in the rat of successive infections with a nematode, skin reactions of human subjects with trichina antigen, immunity studies with tapeworm material in rats, comparative studies of the eggs and life histories of certain Californian anopheline mosquitoes, the life history of an eye gnat of medical interest and lice in relation to their hosts. A program feature of much interest to the society also was the general address given on Monday evening in the Municipal Auditorium by its past president, Dr. R. P. Strong, on "The Family Filiariidae."

At the business meeting on Wednesday the following officers were elected for 1932: *President*, M. C. Hall; *vice-president*, W. H. Taliaferro; *secretary-treasurer*, Norman R. Stoll, Rockefeller Institute, Princeton, N. J.; *council members for four years*, J. F. Kessel and D. H. Wenrich.

The Wilson Ornithological Club met on Saturday, Sunday, Monday and Tuesday, with Saturday and Sunday given to an ornithological excursion to Avery Island as the guests of the Honorable E. A. McIlhenny, and Monday and Tuesday devoted to the reading of papers and the presentation of moving pictures. The papers and films covered a wide variety of topics, including reports of ornithological exploration, migration studies, local observations, the influence of ecological factors, such as temperature and relative humidity, Merriam's temperature laws, physiological tolerance of birds, egg-laying cycles, conservation, nesting, the mechanics of flight and methods of study. Seven titles were presented by moving pictures. Among the features of the meeting was the announcement of the finding of nesting golden eagles in the eastern United States. Mr. Ganier found a nest in the Cumberlands of Tennessee after a search involving leisure time for three years. The work of Kendeigh on the physiological tolerance of birds for cold is of very great significance, since winter nights may be too cold for certain species to survive through the night. This work on minimum temperatures paved the way for Shelford's criticism of Merriam's laws of temperature summation on the ground that the temperature summation curve does not agree with the actual experimental results at very low temperatures, such as occur frequently at night in the winter, or with very high temperatures, such as occur on almost any summer's day.

A very significant paper was given by Mr. Glenn W. Bell, indicating the great influence of the progress

of the nesting cycle upon the *amount* of song of different species. Mr. Paul R. Elliott, in his paper, gave data showing the effect of temperature on the songs of birds. High temperatures are especially important for the mockingbird.

Perhaps the above papers represent the high lights of the Wilson Club program, but they give a very inadequate idea of the program as a whole.

A very pleasing dinner program was climaxed by the talk on the conservation policy of the National Association of Audubon Societies by its president, Mr. T. Gilbert Pearson.

SECTION G (BOTANICAL SCIENCES). **BOTANICAL SOCIETY OF AMERICA. **AMERICAN PHYTOPATHOLOGICAL SOCIETY. **AMERICAN SOCIETY OF PLANT PHYSIOLOGISTS

(Reports from Sam F. Trelease, A. J. Eames, A. S. Foster, L. M. Leonian, J. M. Arthur, W. T. Penfound, W. E. Loomis and F. C. Meier)

Section G met on Tuesday afternoon in joint session with the associated botanical societies. Dr. E. J. Kraus delivered his address as retiring vice-president for Section G, his subject being the organic nutrition of plants. This address was followed by a symposium on tropical botany. After introductory remarks by Dr. E. D. Merrill, chairman of Section G, a paper by Professor F. L. Stevens on tropical pathology and mycology was read. Professor S. J. Record outlined an international program for a world-wide study of woods. Dr. H. A. Gleason discussed the progress of botanical exploration in tropical South America. Professor H. H. Bartlett spoke on plans for conducting a biological survey of the Maya area of Central America.

The Botanical Society of America held a most successful meeting from Monday to Thursday, with a membership attendance of about 200. Five sections held well-attended meetings for the readings of papers on three days. The three morning sessions of the general section were well attended and papers dealing with a wide range of botanical papers were presented and discussed. On Tuesday morning, the papers dealt largely with problems of ontogeny and morphogenesis, including reports of foliar development in several woody dicotyledons and in *Nicotiana*, regeneration in *Bryophyllum*, development of peltate hairs in *Shepherdia* and factors determining the size of the vascular system in fern petioles. During the Wednesday morning session, the papers dealt with various phases of morphology and anatomy, including the embryogeny of *Cryptomeria* and *Chamaecyparis*, the comparative morphology and ontogeny of certain hepatics, the formation of multiple male cells in *Cupressus arizonica*, the anatomy of certain cacti, the method of growing and commercial preparation of

important Philippine fiber plants, the factors influencing the formation of tyloses in *Juglans* and the origin of adventitious roots in cuttings of *Rosa* and *Cotoneaster*. One paper of particular morphogenetic interest showed the essential similarity of the wound responses of gymnosperm and dicotyledonous foliage leaves. On Thursday morning a number of papers of cytological interest were presented, including an account of diploid and tetraploid forms in *Tradescantia* and certain unusual nuclear phenomena in ferns. In addition, a description was given of structural features of a new species of *Calamites* and of a *Lepidocarpon*, and a paper treating of divergence in evolution, as shown by extermination experiments on certain "high" and "low" algae, was read. During the last session, Dr. M. A. Chrysler, of Rutgers University, was elected chairman of the general section for the coming year.

The annual dinner for botanists was held on Wednesday evening, with an attendance of 184. President C. J. Chamberlain presided, and Retiring President L. W. Sharp delivered the presidential address. Through the courtesy of the New Orleans Botanical Society and New Orleans University, entertainment was provided by a colored quartet. Announcement was made of the election of the following officers for 1932: *President*, G. J. Peirce; *vice-president*, A. J. Eames; *secretary*, S. F. Trelease; *editors, American Journal of Botany*, L. W. Sharp, B. M. Duggar; *representative, National Research Council*, A. J. Eames; *alternate to representative*, Margaret C. Ferguson.

One day was given in some sections to an all-day field trip, an unusual feature of w. meetings, which was very popular and successful.

The mycological section held one sectional meeting and a joint session with the Phytopathological Society. Papers were presented covering a wide field of topics, such as parasitic habit of *Marasmius sacchari*, distribution of fungi over the world, utilization of cellulose by myxomycetes, cytological studies of *Tulasnella*, phylogeny of fungi, morphology of *Entomophthora*, sexual condition in *Dietyuchus*. During the business session it was proposed that a mycological society be formed, with *Mycologia* as its official organ. A questionnaire, previously sent to members of the section, revealed the fact that the majority of members favored the formation of such a society. The American Mycological Society was formed, and the following men were elected officers: *President*, W. H. Weston; *secretary-treasurer*, H. M. Fitzpatrick; *councilors*, N. E. Stevens, C. R. Orton and H. S. Jackson.

Sessions of the physiological section were held on Tuesday, Wednesday and Thursday mornings. Four papers on seed germination were presented: Alice M.

Andersen discussed the effect of dilute nitric acid and alternating temperatures in forcing germination of bluegrass seeds; Johanna Giersbach, William Crocker and Lela V. Barton gave papers on the effect of both dry and wet storage followed by low after ripening temperatures on the germination of wild plum, silver bell and bayberry seeds. Dr. B. E. Livingston and Mr. W. B. Mack told of the effect of oxygen pressure and ethylene on the CO₂ output of wheat seedlings. Dr. W. T. Swingle stated that the Satsuma orange in Japan produced bud spores which remained dwarfed, but that the same species had been growing along the Gulf Coast of the United States for 50 years and had produced no dwarf mutations. The production of this mutation in Japan was attributed to the low temperatures of spring and summer. Dr. Swingle also discussed the commercial possibility of using pollen from late or early maturing varieties of dates as a means of hastening or retarding fruit production in various species of the date palm. Professor W. H. Chandler presented evidence to show that pollen cells are killed by the formation of ice crystals during freezing. It was found by Professor Evelyn I. Fernald that the region of greatest freezing point depression in asparagus tips was about 1.5 to 3.7 cm below the tip. Professor H. S. Reed discussed the effects of mottle-leaf disease of citrus on the cells of the leaf; the progress of the disease reduces the number of palisade cells and greatly increases the acidity of the protoplasm. Mr. A. S. Crafts observed that sieve tubes become permeable when mature and that they provide conduits for the movement of organic foods going from the leaves. Five papers on radiation were given: Mr. H. J. Fuller and Mr. F. L. Wynd reported that enzymes were increased in plants exposed to the lethal ultra-violet region; plants similarly irradiated by the use of regions of longer wave-length showed an increase in calcium and a decrease in phosphorus; Professor B. M. Duggar and Mr. A. Hollaender, using monochromatic radiation of definitely defined intensities, reported that far greater intensity is required to inactivate the virus of tobacco mosaic than to kill bacteria; Mr. J. M. Arthur and Mr. W. D. Stewart presented papers on the production of red pigment in apples upon exposure to various artificial light sources, and the increase in growth and dry weight brought about by shading plants down to 35 per cent. of open sunlight during June and July. Dr. E. F. Davis described the effects of placing seeds and other living cells in centrifugal forces of a million times gravity in a super centrifuge, observing that cells often recovered from forces which were sufficient to throw the protoplasm against one side of the cell. Dr. Davis discussed other studies made on the reduction of the toxic substance juglone, produced by the black walnut. By the injection of oxidation-reduc-

tion indicators *Trianea bogotensis* was found to have the power of reducing juglone. The abstracts of most of the papers presented will be found in the supplement to Vol. 18, *American Journal of Botany*, December, 1931. The officers of the section for the new year are: *Chairman*, F. E. Denny; *vice-chairman*, E. C. Miller; *members of the board*, G. J. Peirce and O. F. Curtis; *secretary-treasurer*, J. M. Arthur.

The systematic section, under the chairmanship of Dr. B. C. Tharp, held two meetings of the section, two joint meetings and one all-day field trip. At the Tuesday morning session Dr. Frank Gates gave an interesting discussion on the rapid spread of new plants into and throughout Kansas along roads and railroads. The Russian thistle, so numerous and troublesome in the past, has almost ceased to be a pest. Dr. Ottley indicated that the species *Petunia axillaris* and *P. violacea* can readily be separated on the basis of pollen grains and that the forms passing in horticultural and genetical literature as these species are mainly hybrids. Dr. Minna Koch indicated that the position of the tribes of the Compositae as at present found in the manuals does not correlate with her findings.

The symposium on southern vegetation on Wednesday was attended by approximately 100 persons. The habitat of the Venus fly-trap, the vegetation of the fresh-water lakes and that of the haystack dunes were interestingly described and pictured by Professor Ives. Professor Kurz stated that some eighteen species of northern plants, not otherwise found in Florida, may be found along the Apalachicola River bluffs, in the Tallahassee red hills and in the Marianna red lands. Dr. Miriam Bomhard described and pictured some fourteen species of palms introduced into New Orleans and the difficulties of identification set forth. In the business session which followed officers for 1932 were elected as follows: *Chairman*, Alfred Gunderson; *secretary*, Norman M. Grier.

The American Society of Plant Physiologists held a very successful and well-attended meeting. Forty research papers were presented at the regular sessions of the society. One period was devoted to a round table discussion of research methods, with Dr. W. E. Tottingham as the leader. Drs. C. O. Appleman, E. S. Johnson, Walter Thomas and others discussed different phases of the topic. Two joint sessions were held, one with the American Society for Horticultural Science, and the other with Section G, the Botanical Society and the American Phytopathological Society.

At the annual dinner of the society the retiring president, Dr. Tottingham, presented an address on "The Contribution of Plant Physiology to Biochemistry." Dr. C. O. Appleman was elected Charles Reid Barnes life member of the society. In his acceptance Dr. Appleman stated that he was waiting in Dr.

Barnes' classroom at the time Dr. Barnes was accidentally killed on his way to class.

At the scientific sessions of the society Dr. J. H. Beaumont reported that the photoperiodic response of Irish potato could be reversed by changes in growing temperature of less than 10° C.; Dr. J. C. Ireland described an instrument for recording sunlight intensities; Dr. E. J. Lund and his students presented new evidence on the nature of electrical polarity in plants. Dr. E. S. Johnson reported that the phototropic response in plants is conditioned by green and blue light and not by the red; Dr. G. W. Searth found that stomatal movement of many plants is affected by temperature as well as by light, water and CO₂. Dr. W. H. Eyster reported that certain strains of maize were apparently unable to utilize sugars unless supplied artificially with insulin; Dr. J. P. Bennett found that the iron in the chlorotic leaves of plants on calcareous soils is held in the leaves in an insoluble form, and Dr. E. S. Reynolds reported that while tree trunk temperatures follow air temperatures they lag significantly during falling temperatures.

The American Phytopathological Society held its twenty-third annual meeting from Tuesday through Thursday, in conjunction with its southern division, with about 125 pathologists in attendance. Forty-eight new members were added to the rolls, bringing the total membership to slightly over 836. The following officers were elected: *President*, F. D. Heald; *vice-president*, J. G. Dickson; *secretary-treasurer*, F. C. Meier (reelected); *councilor*, L. O. Kunkel. Dr. L. E. Miles was elected councilor, representing the southern division. H. B. Humphrey was reappointed editor-in-chief of *Phytopathology*. Ninety-six papers were delivered before the society's several sessions. Three joint sessions were held, as follows: with Section G of the American Association, Potato Association of America, and Mycology Section of the Botanical Society of America.

Full abstracts of the papers presented will appear in the January, 1932, number of *Phytopathology*. The important advances made in the sessions are mentioned below. The use of naphthalene against soil organisms of the *Sclerotium rolfsii* type was declared by Dr. Freeman Weiss and Mr. E. L. Evinger to be very effective and inexpensive. Transmission of the peach phony-disease virus, according to Dr. Lee M. Hutchins, is possible only through diseased roots, the virus apparently having the ability to travel only in an upward direction and becoming inactive when diseased tops are grafted onto healthy roots. Controlling bottom rot of lettuce by dusting with mercurial dusts, as developed by Dr. G. R. Townsend, is the only method of combatting this serious New York disease, efforts along all other lines having been in vain. The greenhouse dissemination of cereal-rust

spores led to the discovery of a fungus and bacterium, both apparently part of the normal intestinal flora of the garden slug, and yet pathogenic to the cereal rust-fungi, declared Professor A. A. Granovsky, Dr. M. N. Levine and Dr. J. G. Leach in two papers. The question whether *Bacterium tumefaciens* is a mutant or a pathogenic pleomorph of *Bacillus radiobacter* was raised by Miss Nellie A. Brown and Mr. Lewis T. Leonard. Mr. Sydney Dickinson and Mr. M. B. Moore, in separate papers, comprehensively discussed the genetics of the smut fungi, *Ustilago zeae*. The natural hybridization of cereal rust biologic forms was reported by Dr. E. C. Stakman, Mr. Lee Hines, Dr. Ralph U. Cotter and Dr. M. N. Levine. The following new diseases were reported: a bacterial disease, related to fire blight, by Dr. H. R. Rosen; *Clitocybe* mushroom rot of bananas and citrus, by Mr. Arthur B. Rhodes; a seedling-blight stage of onion bulb rot, by Mr. Glenn N. Davis and Dr. Chas. S. Reddy; *Ophiobolus oryzinus* on rice in Arkansas, by Dr. E. C. Tullis; *Ampelomyces quisqualis* on *Erysiphe polygoni*, by Mr. Cecil E. Yarwood; *Erysiphe malachra* on cotton, by Dr. E. V. Abbott; stunt of Cyclamen, by Dr. L. M. Massey and Mr. Paul E. Tilford; and "June yellows" of strawberries, by Mr. A. G. Plakidas.

SECTIONS F AND G (BOTANICAL AND ZOOLOGICAL SCIENCES). **AMERICAN SOCIETY OF NATURALISTS.

**ECOLOGICAL SOCIETY OF AMERICA. **AMERICAN MICROSCOPICAL SOCIETY. GENETICS SECTIONS, AMERICAN SOCIETY OF ZOOLOGISTS AND BOTANICAL SOCIETY OF AMERICA. †PHI SIGMA BIOLOGICAL RESEARCH SOCIETY

(Reports from J. H. Bodine, Alfred Emerson and James E. Ackert)

The annual symposium of the American Society of Naturalists was held on Thursday afternoon. The general subject for the session was "The Biology of Sex." Dr. C. E. Allen discussed sexual differences in angiosperms and bryophytes, stressing sex potency and sex-influencing factors, as well as sex tendencies in these groups, and pointed out ways in which sex may be modified in plants. Dr. Emil Witsehi discussed the theories relating to causes of sex in animals, reviewing the present knowledge and pointing out especially sex conditions and the results of experiments with amphibia. His theory proposed a so-called "inductor" or "hormone" theory of sex-differentiation. In the final paper, Dr. H. J. Muller discussed the evolution and biological significance of sex and its relation to the diffusion of mutations through a population. He emphasized the increasing importance of particular genes through a "focal process," marking a critical point in sex-differentiation.

At the business meeting, immediately following the

symposium, the society formally adopted the recommendations of the committee on policy which were tentatively accepted at the Cleveland meeting a year ago. Officers elected for 1932 are R. A. Gortner, president, and H. J. Muller, vice-president. E. W. Lindstrom was elected secretary for a term of three years and Sewall Wright was reelected as treasurer for two years. It was voted to appropriate \$50 from the treasury to the Union of American Biological Societies and \$50 directly to the support of *Biological Abstracts*. Fifty-two new members were elected.

The naturalists' dinner, which was well attended, was held on Thursday evening. The presidential address which will be printed in *SCIENCE* was given by Dr. S. J. Holmes, who pointed out that the contacts of whites with more backward races was likely at first to be greatly to the detriment of the latter, but that later a symbiotic relationship developed which was of mutual advantage. He emphasized, however, that this was likely to be succeeded by a stage in which the biological advantages were reversed, resulting in a numerical increase of the less advanced race.

The Ecological Society of America under the presidency of Dr. A. O. Weese held sessions on Monday, Tuesday and Wednesday, with an attendance varying from 25 on Tuesday morning to 65 at the joint session with the Botanical Society of America on Wednesday afternoon. The notable features of the meetings were the joint sessions with the American Society of Zoologists and the Botanical Society of America and the two symposia. The first symposium in charge of Dr. Walter P. Taylor concerned "Ecological Aspects of Wild Life Management," and the second, in charge of Herbert C. Hanson, concerned "Methods in Range Ecology." The committees on the study of plant and animal communities and the preservation of natural conditions under the chairmanship of Dr. V. E. Shelford, had numerous well-attended conferences during the week. A delightful semi-popular lecture entitled "Cypress Scenes and Unseens" was given by Dr. Herman Kurz. The ecologists' dinner was held informally at a French restaurant, at the close of which the vice-president, Dr. Francis Ramaley, gave a short illustrated address on "The Great Sand Dunes of Colorado," and Mr. Percy Vioseca discussed the ecological aspects of the local flora and fauna. The field trips on Thursday and Friday in cooperation with the Botanical Society of America and the American Society of Zoologists were favored by perfect weather and were attended by 183 persons. Drs. E. S. Hathaway and W. I. Penfound and Mr. Percy Vioseca led the parties by bus through delta forests, fresh and salt water marshes, cypress and sour gum swamps and pine forests. Many took advantage of the excellent opportunity for collecting and observing plants and animals in the varied ecological habitats.

At the business meeting on Tuesday afternoon, the following officers were elected: Dr. George E. Nichols, *president*; Dr. Joseph Grinnell, *vice-president*; Dr. Raymond Kienholz, *secretary-treasurer*; Dr. Alfred E. Emerson, *editor of Ecology*; Dr. George D. Fuller, *associate editor* and Doctors A. O. Weese, A. G. Vestal, C. T. Borhies and Stanley Cain, *board of editors of Ecology*.

The American Microscopical Society held its fiftieth annual meeting on Wednesday. The following officers were elected for 1932: *President*, Dr. E. M. Gilbert; *first vice-president*, Dr. Robert T. Hance; *second vice-president*, Dr. I. M. Lewis; *treasurer* (three years), Dr. A. M. Chickering, Albion College, Michigan; *elective member of executive committee* (three years), Dr. J. E. Guberlet. The custodian, Dr. Henry B. Ward, reported that the Spencer-Tolles Fund is now in excess of \$16,000. Drs. J. E. Ackert, secretary, and E. M. Gilbert were named to represent the society in the council of the American Association.

Routine business matters were attended to by the National Council of Phi Sigma, and preliminary plans were made for the holding of a scientific session at Atlantic City next year for the reading of papers by student members.

SECTION H (ANTHROPOLOGY)

(Reports by Carl E. Guthe and C. H. Danforth)

In the realm of physical anthropology emphasis centered very largely around the question of growth. Papers and discussions in this field at New Orleans at the joint sessions with Section K (Statistics, Economics and Sociology) and Section N (Medical Sciences) were focused to an unprecedented degree on the individual, as contrasted with the group. Indeed, the sessions devoted to this subject left a rather definite impression that we may be at the beginning of a new era, in which individual, rather than mass studies, will be foremost. The importance of observing the same individual over the largest possible period was emphasized by nearly every speaker who dealt with any aspect of development. Among these, President Boas emphasized, in his address, the extent to which many statistical procedures tend to smooth out differences that actually exist and are significant; Dr. R. E. Scammon introduced novel data on the reliability of measurements and brought out effectively the importance of seriation and consecutive measurements on the same subject; Dr. H. Bakwin showed the importance of physical types in relation to diseases of infancy, as revealed by studies of individual infants over considerable periods; Dr. O. Klineberg stressed the necessity of considering rate of growth and growth span in studies of physiological age or "intelligence quotients," and emphasized especially the fallacies inherent in conclusions from data on groups based on chronology.

Advances in the study of skin color and hair were reported, respectively, by Miss Charlott Morrel and Miss Mildred Trotter. It appears that in untanned skin of present-day students, the black component is higher in males than in females (as conventionally depicted in some prehistoric paintings). The persistent belief that curl of the hair is directly related to flatness of the shaft was again shown to be fallacious, this time in the Arab. Arab hair is of especial interest, in that the most flattened shafts are the largest.

A study of body build and racial extraction of girls of Newcomb College showed, according to Dr. H. N. Gould, an increasing slenderness up to 1927, followed by a tendency toward a heavier build. Although the percentage of students of "Old American" stock is exceptionally high, there has been a great deal of racial displacement, and the present number of students of French and Spanish descent is remarkably low in New Orleans.

In the field of cultural anthropology two specific groups of research were emphasized, largely because of the geographical location of the annual meetings. It was possible to take advantage of the presence of a number of men from Southern institutions, who presented papers upon investigations in their areas. The existence of the Department of Middle American Research at Tulane University and the presence of a few members of field parties about to undertake work in Central America proved an excellent opportunity to discuss problems concerning Middle American anthropology.

At the opening session on Tuesday morning, Mr. Barnum Brown, of the American Museum of Natural History, gave a brief review of the developments during the past year, concerning the antiquity of man in North America. He referred to the finding of an arrow-point under the shoulder-blade of an extinct elephant in Nebraska and to the finding of two artifacts and a hearth of considerable antiquity near Tucson, Arizona. The major portion of his paper was devoted to a discussion of an important discovery of a cave in southeastern New Mexico by a party from the University of Pennsylvania. Here, evidence of human life was found in association with a large series of animal remains, many of which represented extinct mammals, such as the camel, muskox, horse, etc. Dr. Herskovits, of Northwestern University, presented interesting sociological data concerning the rôle played by the "Best Friend" in Dahomey in Africa. Dr. Gilmore gave a brief report upon the accomplishments of a recently organized Ethnobotanical Laboratory at the University of Michigan, which is prepared to identify botanically such anthropological materials as come to its notice.

Part of the sessions were devoted to papers concerning the archeology of the Southern states. Pro-

fessor Pearce, of the University of Texas, with the aid of lantern slides, reviewed the material culture of the peoples who had once lived in eastern Texas. The excellent work which they did in pottery and shell, as well as in other materials, indicates a cultural relationship with the southern Mississippi Valley civilizations. Dr. Dellinger, of the University of Arkansas, had two papers upon the program, one of which concerned the interesting textiles and perishable material obtained by him in one of the caves of the Ozarks, and the other, the records of former Indian life, as illustrated in the pottery and pictographs from northern Arkansas. Dr. Renaud, of Denver University, discussed a group of unusual pictographs which he had found in central Wyoming, of definite cultural significance.

Several sessions of Section H, held jointly with Sections K and L, were devoted to a discussion of Middle American anthropological problems. (See the report of Section L.)

At the annual dinner of Section H, Dr. Carl E. Guthe, of the University of Michigan, the retiring vice-president, gave an address upon the Maya lunar count, in which he presented some interesting results of a mathematical consideration of the Maya method of counting lunations.

The following evening, the members of the section were privileged to see six reels of motion pictures taken on several expeditions sent out by the Department of Middle American Research of Tulane University to southern Mexico and northern Central America. Mr. Frans Blom interpreted this interesting and, in certain instances, unique record.

Those who attended the meetings of Section H have felt that the few days spent in New Orleans were very successful from a scientific standpoint and personally enjoyable. This was due to the wholehearted and courteous hospitality extended to the members of this section by the Department of Middle American Research of Tulane University. Mr. Frans Blom, the director, and all the members of the staff, as well as many of the friends of the department, did everything in their power to make the visit to New Orleans a delightful one.

SECTION I (PSYCHOLOGY). †SOUTHERN SOCIETY FOR PHILOSOPHY AND PSYCHOLOGY

(Report by John E. Anderson)

Section I held sessions from Tuesday, December 29, to Thursday, December 31. The vice-presidential address, entitled "The Physiology of Consciousness," was given by Dr. Edwin G. Boring, of Harvard University, retiring vice-president for Section I, at a joint dinner with Section Q held on Tuesday evening. Dr. Boring, after a critical analysis of recent points of view and the implications of modern researches in psychology, neurology, physiology and related fields

for the problem of consciousness developed the thesis that introspection is a method for the observation of certain events in the brain. At this dinner Dr. Leonard A. Koos, of the University of Chicago, retiring vice-president of Section Q, described the methods and procedures used in the national survey of secondary education now under way. On Thursday afternoon a joint session with Sections C and N was held. This took the form of a symposium on mental disorders. Dr. Abraham Myerson, of Tufts Medical College, speaking on the "Biochemical Aspects of Brain Activity," presented the results of chemical analysis of arterial blood flowing into the brain and the venous blood returning from the brain to show that in a brain activity much sugar is utilized. Dr. F. A. Moss, of George Washington University, speaking on "The Scientific vs. the Psychic Approach to the Study of Mental Disorders," pointed out the necessity of continuing our investigations on the physical causes of mental disorders and showed that the practical results claimed for the psychic approach should not deter us from more fundamental studies. Dr. G. Holmes Richter, of the Rice Institute, speaking on "The Colloidal Chemistry of Psychiatry," presented the results of observations with the bright field microscope on the activities of living nerves and stressed the importance of recent researches in colloidal chemistry for our understanding of the nervous system and psychic phenomena. (See the report of Section N.)

On Tuesday, Wednesday and Thursday mornings the Southern Society for Philosophy and Psychology held its twenty-seventh annual meeting. Contributed papers, both from members of the Southern Society and from members of Section I from other districts of the country, were presented. A total of 35 papers, covering a wide variety of topics in the field of psychology and philosophy, were read. The Tuesday morning sessions contained a number of papers on the acquisition of motor skills and on memory and forgetting. The Tuesday afternoon session was concerned largely with sensory and perceptual phenomena. The Wednesday morning sessions were devoted to papers on philosophy; the Wednesday afternoon sessions to papers on child development and on intelligence tests, and the Thursday morning sessions to abnormal mental phenomena and to studies of emotion. All the sessions were well attended and were marked by energetic and interesting discussion.

At the dinner meeting of the Southern Society held on Wednesday evening, Dr. Harry M. Johnson, of the American University, gave the presidential address, entitled "Some Follies of Emancipated Psychology." He made a searching analysis of psychological material appearing in text-books and in popular presentations of psychology in order to demonstrate the errors that arise in the transition from

scientific reports to text-book and popular presentation. At the business meeting of the society, Miss A. F. Liddell, of the Florida State College for Women, was elected president of the Southern Society.

SECTION K (SOCIAL AND ECONOMIC SCIENCES)

(Reports from Harold Hotelling, Irving Fisher and Howard Richards)

At the Monday session of Section K, Professor Sanford Winston described a sample of more than five thousand completed families selected with reference to social class. More boys in proportion to girls are born to parents in prosperous circumstances than to the poor, according to Professor Winston. He found further that small families had a higher proportion of males than large families, which is another indication of the greater excess of males in the higher economic groups, since these groups have fewer children. This effect he attributed to the better prenatal care which mothers in the more prosperous families receive, with the result that fewer miscarriages occur. Since a great preponderance of miscarriages are male, a large number of interruptions of pregnancy, resulting from neglect, poverty and ignorance, leaves fewer males to be born alive.

The sturdy conservatism of the rural people of Vermont in holding tenaciously to their soil through one economic reverse after another was pictured by Professor Genieve Lamson, of Vassar College, as she traced their shifts and changes in response to difficulties brought on by the repeated lowering of the prices of their products. She described the pride of these old-time American families in having given so many leaders to the nation, the consolidation of farms now taking place, with vacant buildings as one result, and the slowness of the infiltration of foreigners, who are chiefly French Canadians.

Professor R. M. Harper showed graphically at this session the interrelations of demographic factors in the population of Switzerland. President A. O. Bowden, of New Mexico State Teachers College, described the results of a questionnaire showing an appallingly great amount of superstition and ignorance in the general population, with only a slightly better showing by school teachers. These papers were presented on Monday afternoon, the section abstaining from a Monday morning session in order to allow the members to attend the meeting of the American Mathematical Society devoted to statistics.

A symposium on cotton was held on Tuesday morning in the municipal auditorium, under the chairmanship of Mr. L. L. Janes, of the United States Department of Agriculture. Mr. S. Locke Breaux, who has been connected with the New Orleans Cotton Exchange since 1875, opened the symposium with an

account of the activities of the exchange, defending it against the attacks which have been made in Congress and elsewhere. The invitation to visit the exchange, extended to all members of the association, was seconded by Mr. Breaux and taken advantage of by a number of members of Section K. Owing to the unavoidable absence of Mr. J. W. Bateman, director of agricultural extension at Louisiana State University, his paper on "Cotton from the Viewpoint of the Farmer" was read by Dean J. G. Lee. Mr. Robin Hood, secretary of the National Cooperative Council, spoke on "The Objectives of the Cotton Cooperatives."

The social and economic institutions of the Mayans were the subject of a symposium on Tuesday afternoon jointly with Section L. (See the report of Section L.)

Professor Charles A. Ellwood, of Duke University, presided at the Wednesday morning session and opened the meeting by stressing the importance of historical as compared with psychological methods. Professor Kenneth E. Barnhart, of Birmingham-Southern College, showed that the high homicide rates in Southern cities represent chiefly murders among illiterate Negroes. He predicted that the rapid growth of literacy now taking place, particularly in the colored population, will result in a decrease in the number of homicides. Professor Walter C. Reckless, of Vanderbilt University, spoke on the use of observation and statistics in the placement of foster children, describing observations made on orphan children for five-minute intervals with a view to an objective evaluation of traits relevant to their placement. Professor M. D. Anderson, of the University of Florida, described his interesting "relativity theory" of capital and interest illustrating the theory with graphs of the trends of financial variables.

A symposium on growth was held, jointly with Sections H and N, in two parts, on Wednesday afternoon and Thursday morning. (See the reports of Sections H and N.)

The subject of growth was resumed in a different application by Professor Edwin B. Wilson, of the Harvard School of Public Health, who spoke on Thursday afternoon at a joint session with Section A (Mathematics) on "Laws of Population Growth." With Miss Ruth R. Puffer, Professor Wilson used the method of least squares to fit logistic curves to a considerable number of human populations. The fit was in general close; but the characters of the parameters of the curve determined in this way were often surprising. In some cases the parameters were imaginary or of a sign opposite to that usually attributed to them. The curve, which is ordinarily assumed to rise more slowly than the Malthusian geometric progression, sometimes rose even more rapidly than that suggested by Malthus, actually approaching a vertical

asymptote. The absurdity of these results formed the basis for the authors' opinion that the logistic curve is of very little value for predicting populations.

Earlier on Thursday afternoon a joint session with Section L was addressed by Professor Robert G. Caldwell, of Rice Institute, and by Professor William B. Munro. (See the report of Section L.)

The Econometric Society met jointly with Section K in New Orleans, Louisiana, on the morning and afternoon of January 1, 1932. Three papers were presented at the morning session, at which Professor Griffith C. Evans, of Rice Institute, presided. The first, by Dr. Charles F. Roos, pointed out several errors in the static theory of cost and gave a dynamical theory which avoided these. Dr. W. A. Shewhart, of the Bell Telephone Company, pointed out the advantages of standardization and demanded a fairer basis for competition. The following paper was that of Professor Hotelling, which discussed certain surprising results of two interrelated demands when one of them was subjected to a tax. At noon a luncheon meeting was held, at which Professor Fisher, president of the Econometric Society, described its origin and objects.

Professor Hotelling presided at the afternoon session, four papers being presented. The program began with a paper by Professor Edwin B. Wilson (and Miss Margaret M. Hilferty), of Harvard University, which was a brief statement of the distribution of chi-square in comparison with the normal probability curve. The second paper was that of Professor Evans, which treated the various uses and results of employing economic hypotheses. Dr. Mayer then suggested that classical dogmas regarding value be abandoned and that in social study we utilize the socio-psychological disciplines. The final paper was that of Professor Canning, who discussed whether there is such a thing as a "constant expense" in enterprise operations and attributed part of the amplitude of business cycle swings to belief in misleading income data.

The fifteenth annual meeting of the Metric Association was held on Tuesday. Dr. A. E. Fossier, director of the Board of Health of New Orleans, welcomed those attending on behalf of the City of New Orleans, and later in the day conducted a party to places of interest in and about the city. A paper by Dr. George F. Kunz pointed out various instances of the spread of metric measures in the United States. Mr. A. E. Pradillo, of the New Orleans Association of Commerce, suggested an educational campaign for the people to get acquainted with the advantages that would accrue to this country with the use of the metric system. A report was presented from Dr. Arthur E. Kennelly regarding the progress of the metric movement in Japan. Miss Leora Blair, of the Louisiana

State Normal College, discussed her methods of teaching the metric system, using only the metric weights and measures needed for practical use.

Officers elected for 1932 are: *President*, George F. Kunz; *first vice-president*, Arthur E. Kennelly; *second vice-president*, Theodore H. Miller; *third vice-president*, Wm. Jay Schieffelin; *treasurer*, James F. Martin; *secretary*, Howard Richards.

SECTION L (HISTORICAL AND PHILOLOGICAL SCIENCES)

(Report from Richard Stephenson and Joseph Mayer)

Section L held its first meeting in joint session with Sections H and K on Tuesday afternoon, December 29, for a discussion of the culture and civilization of the ancient Mayas. Dr. S. G. Morley presented facts concerning the organization of various expeditions to the Maya field and the assistance obtained from various scientists in this field. Mr. Frans Blom discussed generally the articles of commerce, where these were obtained by the Maya, and their monetary system. He also displayed a large map which delineated in colors the areas from which the ancient Maya folk obtained their various commodities. This session was well attended.

The second session of Section L was held jointly with Section K on Thursday afternoon with Dr. Griffith C. Evans presiding. Professor Caldwell traced the repetition of periods of prosperity and panic through Colonial times, the land panic of 1819, the canal panic of 1837, the railroad panic of 1857 and the financial panic of 1873. He suggested that the rhythm may perhaps be due to each generation of men learning by its own mistakes, which are forgotten by the next generation. He spoke also of a theory of binary panics: an agricultural one shortly after a great war and an industrial panic about eight years later than this. The theory, he pointed out, is plausible, but on account of the inadequacies of the historical method can not be regarded as proved. He declared that the United States has brought the present depression upon itself by following at the same time the mutually incompatible policies of collecting its foreign debts and of maintaining a tariff that makes payment impossible.

Professor Munro ascribed the world depression to democratically inspired excessive governmental expenditures which exceeded the tax-collecting powers of the government and led to impairment of credit.

The third session of Section L was held jointly with Section H and was concerned with Maya archeology. By means of lantern slides Dr. S. G. Morley displayed photographs taken by Colonel and Mrs. Lindbergh in their flight over the Yaxchilan region, pointing out that the chief value of the Lindbergh photographs lay in the fact that for the first time the

subject of Mayan archeology was given such publicity as to make it of national interest, and in the fact that the photographs from the air gave the excavators better ideas of the topography than could be obtained by land exploration. Dr. Morley next presented lantern slides concerning his own expedition of April, 1931, and discussed the significant discoveries made at that time. Dr. Hermann Beyer, of the Tulane Department of Middle American Research, read a most scholarly paper on "The Stylistic History of the Maya Hieroglyphs" from the earliest times through their decline after the Spanish conquest. And finally at the last session of Sections L and H, Mr. Frans Blom, of Tulane University, read a paper on "The Negative Batter at Uxmal and Other Maya Ruins," which presented the general fact that the façades at Uxmal lean outward to enhance the sculpturing on these façades.

SECTION M (ENGINEERING)

(Report from N. H. Heck)

The address of the retiring chairman of the section, Dr. Frank B. Jewett, dealt with the new place that must be taken by the engineer if society as a whole is to live a happy life and avoid some of the present dangers. We can not continue to live in a highly mechanized age on the rules and regulations suited to an earlier trading and agricultural age. The engineer must learn to take his place, first through better education of engineers to make them more competent to take a proper place in the whole scheme of society; second, his societies and allied organizations must see their responsibilities in a broader way, and, finally the rank and file of mankind must be educated so that they will not be fooled in regard to matters of science and engineering. Experience shows that we can not be so fooled without nature taking her revenge. Such education is easy for small groups but, in the case of millions, it is a grave task. In certain fields we are reaching the limits of possible developments and in such cases we should be content with a filling-in process. Engineers will have to have better understanding of the properties of materials and of the work being done by scientists in these fields. Future construction will have more refinement of detail than in the past. In accomplishing these things the engineer must not get too far from the field of creation or he will lose much of the mental satisfaction which most engineers are incapable of getting from the purely intellectual side of the work.

Lieutenant H. D. Vogel discussed the laboratory solution of river problems. He pointed out the difficulties encountered by experimenters in designing, building and operating small scale models of rivers, the need for better approach to this problem for rivers of large size and the absolute need, in the case

of long stretches of river, for the use of distorted models, that is, with vertical scale considerably in excess of the horizontal. He showed that with suitable assumptions distorted models give good agreement with the results of observation of actual river performance. Accordingly, laboratory studies are indispensable in understanding river problems.

Mr. George G. Earl gave a complete analysis of rainfall at New Orleans, and, among other things, showed that three inches or more in one hour occurred eight times in thirty-six years and that there have been fourteen inches in nine hours over the whole forty-four square mile extent of the city. Since the whole city lies at, near or below gulf level, all rainfall, except that absorbed, must be removed by pumping through an elaborate system of canals which discharge into Lakes Borgne and Pontchartrain. The present capacity is fourteen inches in twenty-four hours for the entire area, a considerably greater discharging capacity than that of Chicago with ten times the drainage area. The prompt removal of rain water, combined with improved water supply and sewage disposal, have resulted in great improvement in sanitary conditions and consequently in living conditions.

Mr. C. F. Hirshfeld stated that for cities upward of 100,000, the continuation of the street railway is a necessity to provide transportation for the common man. At present 60 per cent. of downtown transportation is by street car, and only 8 per cent. of the original street railway mileage has been replaced by buses. The street railways from early prosperous conditions are now in a generally bad way, and development of new ideas is necessary to render the street car sufficiently attractive to compete with other forms of transportation. Through cooperation of the companies an organization has been formed to learn the facts and find remedies. A questionnaire brought out the demand for better ventilation and quietness rather than for mechanical perfection and speed. The significance of the investigation is that means must be found to save an industry of five and one half billion, with the certainty that, if lost, there must be replacement at even greater cost.

Mr. J. F. Coleman dealt with foundation problems in New Orleans. The existence of alluvial deposits of great depth, complicated by local deposits of quicksand a few feet below the surface, and in other places with beds of fine clay and of decayed vegetation, presents a foundation problem of unusual difficulty. Until recently most of the material was saturated at a depth of a few feet, but in some places drainage has lowered the upper limit of saturation. Before drainage the upper surface gave better bearing for loads than the subsurface. The drainage has in some cases resulted in the decay of wooden substructures with

consequent settling of buildings. In other cases the surface has settled through several feet, even without load. In some cases this settling has exposed cypress stumps, belonging to one of several layers of buried swamps, and a structure resting on a stump is at an obvious disadvantage. Great care is necessary in the design of foundations and piles must be driven with great care. Often they must be so thickly placed that those last driven force the others up, with later settling and carrying the structure with them.

Major R. F. Fowler, U. S. Engineers, discussed inland waterways. In spite of the great development of the railroads certain types of freight, including such low grade bulk cargo as coal and steel products, have continued to be carried by water. The world war conditions emphasized the importance of this auxiliary means of transportation. Much attention has been given recently to the design of vessels, and screw propellers placed in tunnels are proving more efficient for shoal water navigation than the old paddle wheel steamers, though many of these are still in effective use. The greatest cargo ever moved at a single time was moved by a towboat of the tunnel type. Attention has been given to the modernizing of terminals and rail connections. The connection of isolated, disconnected channels to make through channels of the needed depth is now going on. Many problems of river regulation have yet to be solved.

Professor J. H. Pound showed the remarkable development of pipe-line transportation of natural gas, oil and gasoline during 1929-31, a development so important as to threaten seriously the prosperity of the railroads in the regions affected. Gasoline pipe lines of lengths even up to 1,400 miles have been found profitable and this even in cases where the supply is known to be of limited duration. The engineering features of the construction of pipe lines are of interest, since the lines are carried through every type of country encountered, some of it very difficult. Welding of pipes has become of importance and prevention of corrosion is an important problem as yet unsolved. Rivers are crossed on bridges, through tunnels or by laying pipe in the river bed. Since there is demand for this service, pipe lines are likely to continue to increase in spite of all obstacles.

SECTION N (MEDICAL SCIENCES)

(Report from F. A. Moss)

The meetings for Section N were very well attended. Programs were arranged for seven sessions, beginning with Monday afternoon and extending through Thursday afternoon. A total of 43 papers was given, representing a variety of fields. Several joint symposia were arranged, one for the Tuesday afternoon session, with the American Society of Parasitology; one for the Wednesday afternoon session on the "Growth of

Individuals," with Sections H and K; and another for Thursday morning with Sections H and K on "Growth." The Thursday afternoon symposium, on "The New Approach to the Problems of Mental Disorders," was arranged jointly with Sections C (Chemistry) and I (Psychology).

An excellent paper was given on Monday afternoon by Dr. H. B. Weiser, Rice Institute, on the colloidal theory of gall-stone formation. He showed that gall-stones of the "pure cholesterol" type are formed in the absence of inflammation, while the "layered" stones are associated with inflammation. He demonstrated the chemistry by which stones of a non-inflammatory origin develop.

The program for the Tuesday morning session was prepared by Dr. Musser, of the Tulane Medical School. The paper on "Allergic Nephritis," by Dr. Charles W. Duval, showed that just as we can get allergic reactions in the skin and subcutaneous tissues, so these reactions may be produced in the kidney and cause an acute nephritis. Dr. Harley N. Gould showed that the nationality of ancestors has a very slight influence on the age of onset of menstruation in mothers and daughters. Those of Northern European descent have a later age of onset of menses than those of Southern European descent. The mean age of mothers at the time of first menses is 13.99 years, whereas the mean age of daughters' first menses is 13.61 years; or the daughters menstruate about three and one third months earlier. His study was based on students of Sophie Newcomb College. In this same program, Dr. Leon J. Menville, of the Tulane Medical School, presented the results of a study which he had been making on the gastro-intestinal activity of rachitic rats. In every instance, he found that the food column reached the caecum earlier in rachitic rats than in normal. He found that lack of Vitamin D influenced the peristaltic movements. At this session the address of the retiring vice-president, Dr. Louis B. Wilson, of the Mayo Clinic, was given. It will be reproduced in an early issue of SCIENCE.

The Tuesday afternoon joint session with the American Society of Parasitologists was devoted to parasitology of medical interest and consisted of five papers—one by Dr. Robert Hegner, of the Johns Hopkins University, on "Amoebiasis in Panama"; one by Dr. Walter E. Dove, of the U. S. Department of Agriculture, on "The Transmission of Endemic Typhus"; and a very excellent paper by Dr. C. W. Stiles on "The Present Status of Hookworm Disease in the United States." Dr. Stiles emphasized the fact that the job of eradication is not yet completed and proposed a practical method for attacking the job. He also developed the point that hookworm disease impairs mental capacity, and that the mental condition improves following treatment. Dr. Paul D. Lamson, of Vanderbilt University, gave a report of the

studies which he had been making on the use of various drugs in the treatment of intestinal helminth infestations, and Dr. G. F. Otto, of the Johns Hopkins University, summarized a study which he has been making on "The Ascaris and Trichuris Infestations in the Southern United States."

The Wednesday morning session was given over to the symposium on "The Effects of Drugs and Internal Conditions on Behavior." Dr. Gilbert J. Rich demonstrated that there is a close relation between internal chemistry and personality and that such a relationship can now be outlined in its more general principles. Dr. Joseph G. Yoshioka, of Yale University, concluded from a study which he made, using rats as the experimental animals, that injections of an extract from the anterior lobe of the pituitary gland markedly decreases the restless activity of rats. Dr. Thelma Hunt, of George Washington University, demonstrated that fatigue can be measured by the decrease in the carbon dioxide combining power of the blood. She also showed that the onset of fatigue can be delayed by injecting adrenalin. Dr. J. A. Glaze, of Kansas State Teachers College, found that prolonged fasts cause a decrease in efficiency of the higher psychological processes during the period of the fast, but that mental efficiency is increased following short fasts. Dr. Katharine Omwake, Agnes Scott College, found nervous stability was lowest after two hours of sleep and that it increased directly with the length of the period of sleep. Dr. Frederick J. Cullen, of the U. S. Department of Agriculture, showed how his bureau had succeeded in discovering a number of fraudulent remedies and in removing them from the market.

On Wednesday afternoon and Thursday morning joint symposia were held with Sections H and K on the subject of "Growth." (See the report of Section H.)

On Thursday morning there was also held a symposium on "Nervous Disorders." Mr. Harry F. Hubbard, of George Washington University, pointed out the fact that alienists are constantly disagreeing concerning the sanity of criminals, and that the lack of agreement was largely due to the subjective methods used in diagnosis. He emphasized the need for the same objective methods in psychiatry which the other sciences have found so helpful. Dr. Fred Ebersson, of Mount Zion Hospital, reported a convincing piece of work on the isolation of the organism causing infantile paralysis. Dr. Leon Gordon, of George Washington University Medical School, gave a report on more than one hundred cases of birth injury and showed how idiocy, epilepsy and other mental disturbances follow in its wake. Dr. M. L. Townsend, of Chevy Chase Sanitarium, showed how the removal of focal infection benefits patients suffering from mental disorders. He found this to be especially true in

the case of the manic-depressive psychosis. Dr. Lowell S. Selling, of the Institute for Juvenile Research, found that environment was the chief factor in producing automobile thieves. He found the intelligence of the thieves slightly below normal but not markedly so. He was unable to disclose any emotional abnormalities of importance in this group.

The Thursday afternoon session was devoted to a joint program with Sections C (Chemistry) and I (Psychology), on the symposium subject, "New Methods of Approach to the Study of Mental Disorders." Dr. Abraham Myerson, of Tufts Medical College, showed how brain activity can be studied objectively by puncturing the carotid artery and jugular vein and making comparative analysis of the bloods thus obtained. He found that when the patient is unconscious as a result of anesthesia the brain uses very much less sugar than normally and that during consciousness the brain uses more sugar than either the arm or the leg. The chief contribution of his paper is that it affords a simple scientific method for studying the chemical activity in the living brain. Dr. F. A. Moss, of George Washington University, showed that all basic progress in psychiatry had been made by materialistic methods and that if psychiatrists hope to make any more worth-while discoveries they must go back to the laboratories. Dr. G. Holmes Richter, of Rice Institute, demonstrated how colloidal chemistry might explain the so-called "functional" psychoses, and he indicated that the correct method of treating such disorders was by giving some drug to restore the colloidal chemistry of the brain cells to normal. The papers on this program stressed the point that the bodily condition on which the disorder depends should be of much more concern to the psychiatrists than the mental symptoms which the patient manifests as a result of the disorder.

SECTION O (AGRICULTURE). **AMERICAN SOCIETY OF AGRONOMY. *SOCIETY OF AMERICAN FORESTERS.

**AMERICAN SOCIETY FOR HORTICULTURAL SCIENCE.

†POTATO ASSOCIATION OF AMERICA. GENETICISTS INTERESTED IN AGRICULTURE. CROP PROTECTION INSTITUTE.

(Reports from P. E. Brown, G. H. Lentz, H. B. Tukey, H. C. Moore, Jay L. Lush and Paul Moore)

Section O held a joint session with the Geneticists Interested in Agriculture and the American Society of Agronomy on Monday afternoon, the program consisting of a symposium on the "Genetics of Cotton Improvement." On Tuesday joint sessions were held in the morning and afternoon with the American Society of Agronomy, and thirteen papers were presented, dealing mainly with the use of fertilizers on southern soils. Dr. F. E. Bear presented some new and interesting suggestions relative to the selection of

fertilizers of certain formulas for different crops and varying soil conditions and pointed out the variations in the effects of fertilizers when made up of different materials. He predicted that fertilizers of the future would be required to contain more than nitrogen, phosphate and potash, and to show the content of other necessary plant food constituents, such as Mg, Ca, S, etc., in the formulas. Other papers dealt with fertilizer effects on corn, cotton, oats, sugar cane and other crops grown on individual soil types in various states, the results secured with any fertilizing material being shown to depend primarily upon the soil type. The influence of fertilizers on cotton root rot, on the time of maturity and boll characters of the cotton plant and on the decomposition of cane trash in the soil was discussed. The use of chemical tests to determine phosphorus needs of soils, the nitrogen problem under semi-arid conditions and factors influencing the production of flax fiber cells were other subjects presented. On Tuesday evening the joint dinner with the American Society of Agronomy and other associated societies was held. The address of the retiring vice-president for Section O, Dean W. C. Coffey, of the University of Minnesota, was given at the dinner, the subject being "The Interrelationship of the Biological and Social Sciences in Agricultural Education."

The Society of American Foresters met on Tuesday, Wednesday and Thursday (December 29, 30, 31, 1931) with an attendance of 101 members and 48 guests, of whom 16 were ladies. The program dealt primarily with forest economics, taxation, forest finance and forest revenue. A symposium devoted to "Forestry in the South" brought out the possibilities of practicing forestry in this region. Invitations were extended to lumbermen to attend the meeting, and several of those present contributed to the program. Attention was called time and again for the need of more complete cooperation between the foresters and the timberland owners and operators.

A harbor boat trip, furnished through the courtesy of the New Orleans Dock Board, gave the delegates a respite from the indoor sessions and afforded them a chance to view the city's dock facilities.

President-elect C. M. Granger called attention to some of the problems confronting the Society, and made a plea for continued cooperation on the part of all the members. Congressman Scott Leavitt, of Montana, a former forest supervisor in the U. S. Forest Service, told the members of the legislative measures pertaining to forestry now before Congress, and mentioned briefly his efforts in having forestry legislation enacted.

Fifteen formal papers were delivered on Tuesday and Wednesday. At the business session the report of the Forest Types Committee was presented. The

Journal of Forestry will publish most of the papers which were presented.

The all-day field trip to Bogalusa, Louisiana, in which over 100 persons took part, was probably the outstanding part of the program. The sawmill, nursery and numerous plantations of the Great Southern Lumber Company were visited.

A tour of the pine plantations was made under the guidance of P. C. Wakeley. Survival, height and diameter growth of various aged stands were observed, and the results of using different planting methods and different grades of nursery stock were studied. Attention was called also to the natural reproduction, over some 10,000 acres resulting from the 1920 seed crop. All the plantations and young growth are protected from fire and grazing and show remarkable growth. Mr. P. V. Siggers, of the Bureau of Plant Industry, explained his field studies of brown spot needle blight of longleaf pine.

The twenty-eighth annual meeting of the American Society for Horticultural Science was held in thirteen regular sessions and an additional joint session with the American Society of Plant Physiologists, and included the presentation of 157 papers, representing the largest number in the history of the organization. The general trend of research in horticultural problems is to be seen in the continued interest in tree fruits along the lines of chemical composition and fruiting, stomatal behavior under varying conditions of moisture, growth and humidity, effects of light upon color development of fruit and respiration of fruits in storage at varying temperatures, in the increased attention to problems of the peach along similar lines, in the interest in physiological problems of raspberries, strawberries and grapes, in the continued activity in vegetative propagation of woody plants, in the fundamental nature of scientific effort with vegetable crops, in the direction of scientific effort upon ornamental horticulture and in the definite attainment of scientific rank by investigation with floricultural plants.

In discussions of policy and general business a committee was appointed to urge and cooperate in the cataloguing and indexing of state experiment station publications as well as of U. S. Department of Agriculture publications by the U. S. Department of Agriculture, so that all literature upon agricultural subjects may be brought together in quickly accessible form. It was also pointed out that journal publication had definite advantages, that publication in experiment station bulletins had certain limitations, and that it would seem a constructive and economic step for stations to purchase space in journals in some cases rather than to continue publication in their own series.

The address of the retiring president, Dr. T. H.

McHatton, of the Georgia State College, reviewed the evolutionary changes in horticultural work. Dr. H. A. Jones, of the University of California, Davis, California, was elected president for the year 1932.

The attendance at the New Orleans meeting of the Potato Association of America was not large, but unusual interest was shown in the program. Six papers, dealing with certified seed and potato fertilizers, were presented by Southern experimenters and were of special interest to Southern workers.

Reports on the cooperative potato-breeding project presented by the geneticist of the Office of Horticultural Crops and Diseases, U. S. Department of Agriculture, and by plant breeders of several experiment stations, showed marked progress in 1931 in developing new seedlings. One seedling, the Katahdin, has proven exceptionally good and may replace some of the late standard varieties in several states. The Potato Association of America highly endorsed the work done by the U. S. Department of Agriculture and the Experiment Stations in developing new varieties of potatoes, and passed resolutions asking that more funds be appropriated for potato-breeding work.

Reports from New York and Maine on the development of late blight immune varieties through breeding work were enthusiastically received by both Northern and Southern growers. Evidently the prospects of producing in the near future varieties of potatoes resistant to some of the common diseases are very bright.

Seed potato certification received special attention by the delegates.

The Geneticists Interested in Agriculture met on Monday for a symposium in the forenoon on the "Genetics of Bee Breeding" and a symposium in the afternoon on the "Genetics of Cotton Improvement." The peculiar method of inheritance in Hymenoptera alters the relative importance of sisters, offspring and aunts as indicators of the genetic constitution of the queens and drones to be selected. The difficulty of controlling matings, which has been a serious handicap in the past, seems in a fair way to be solved. Several men with long experience in practical bee-breeding were present and contributed to a lively discussion as to what the ideals of the bee breeders should be and the problems wherein more genetic knowledge was felt to be urgently necessary.

The afternoon meeting on the genetics of cotton improvement was largely concerned with the possibilities involved in crosses of varying degrees of wideness. It was generally felt that extremely wide crosses offered little promise of improving the present varieties, but that crosses of nearly related varieties offered a fruitful field for further improvement. The rapid development of mechanical harvesting of cotton has in some sections made it imperative to breed a

type of cotton better adapted to this purpose. The type of mechanical harvesters so far in use and the steps being taken to breed varieties to meet this new need were discussed.

The members present voted to merge the organization of the Geneticists Interested in Agriculture into the newly formed Genetics Society of America. Dr. R. A. Brink, of the University of Wisconsin, was selected to represent the interests of this group during this merging.

The Crop Protection Institute had its annual meeting on Wednesday, December 30. Professor W. C. O'Kane, chairman of the board of governors, gave a brief survey of some of the year's work. He reported no change in the type of work and only a slow change in the personnel of the board, which was responsible for the general plans of the institute. Projects are still managed through committees.

While the institute had some curtailment of funds, it had under all conditions maintained its work well, and the present projects were even more significant than some of past years. More industrial companies are making use of the institute. A survey through one of the projects developed the fact that more than ten billion gallons of spray material are applied to commercial plantings each year, this being exclusive of spraying in home gardens, greenhouses and plantings too small to be listed, or applications to live stock or household uses. While some of the projects had been concluded, others were still in development, and several new fields were just being entered.

Paul Moore, secretary-treasurer, reported receipts of \$44,159.84 and expenditures of \$47,529.22 during the fiscal year, with a balance on hand at the time of the meeting of approximately \$19,600.00.

SECTION Q (EDUCATION)

(Report from W. L. Uhl)

The sessions of Section Q were on Monday, Tuesday and Wednesday. The address of the retiring vice-president for the section, Professor Leonard V. Koos, of the University of Chicago, was given on Tuesday evening at the joint dinner of Sections I and Q, Phi Delta Kappa and Kappa Delta Pi. Professor Koos outlined the national survey which is being made of secondary education in the United States. Interesting papers were developed at other sessions. Dr. J. E. Adams reported an acceleration experiment in which it was found that brilliant pupils who skipped grades made better records during the year after they skipped than they had made in previous years. Classroom experimentation in the use of portable typewriters was reported by Dr. Ben D. Wood and Professor Frank N. Freeman. The use of typewriters in the elementary school led to an increased amount of written work of improved character and caused no injury to progress in any of the

school subjects. Professor F. A. Ford's study indicated that in many public schools the better a child's mental ability the less favorable is his school success in relation to other pupils. Papers indicating the effects of studying science were given by Dr. G. S. Craig, Dr. G. W. Haupt, President A. O. Bowden, Dr. Otis W. Caldwell and Mr. G. E. Lundeen. These papers indicated that there is little or no relation between the amount of schooling of the common population and the prevalence of their beliefs in magic and superstition. They indicated also that when science teaching is organized with direct reference to certain unfounded beliefs there is an improvement of about 33 per cent. in the eradication of these beliefs as compared with their eradication when such training is not specifically directed against superstitions. Dr. H. W. James and Dr. J. B. Maller reported upon problems of character education. Both papers called attention to the complexity of conflict situations and also to the varying judgments of both students and adults about the proper courses of action in conflict situations. The priority of New Orleans in educational developments was reported by Professor Stuart G. Noble. Mr. Irving P. Foote discussed the tenure of high-school teachers in Louisiana. The value of the amount of high-school Latin as a method of selecting applicants for college was indicated in Mr. E. L. Clark's paper. Diagnostic and testing work was reported upon by Dr. C. C. Ross, Professor H. H. Remmers and Mr. C. E. Prall. Studies of the difficulty of getting meanings from the printed page were reported by Dr. Ernest Horn and Professor A. S. Barr. Dr. Horn pointed out reasons why the present vocabulary studies have failed to indicate, more fully than they have, the reading difficulties which children encounter. Dr. Barr reviewed experimental studies which he has been conducting with special reference to the vocabulary difficulties in American history. Dr. S. L. Eby reported a detailed investigation of students' high-school marks and college marks for an entire graduating class from the University of Cincinnati. The relation of various entrance requirements to subsequent university success in a school of engineering was reported by Professor August Dvorak. He showed that the regression equation clearly predicted subsequent suspension from the school in case of 60 per cent. of the actual failures. The relation of physical to mental development in children in four different countries was given by Dr. S. A. Courtis. Professor H. H. Remmers, in stating the results of measurement in high-school English, showed that the highest pupil in a high school of low standards was found to be below the lowest pupil in a high school of high standards. He concluded that the knowledge of the school's relative standing was necessary in judging the pupil's achievement in English. Pro-

fessor W. L. Uhl emphasized the lack of measurement of such mental functions as social competence, creative work and esthetic experiencing, in the present-day standardized tests. Dr. Grace O. McGeoch reported data which indicate that neither the whole method nor the part method is inherently superior for any individual, but that the relative efficiency of either method is a function of a number of factors. Dr. T. E. Newland presented an analysis of illegibilities in handwriting from the lower grades to adulthood. He found that there are typical illegibilities for certain letters, that these illegibilities tend to increase with age and that remedial and preventive work can be arranged greatly to reduce these illegibilities. The legislative as well as professional difficulties of arranging sabbatical leave for public-school teachers was reviewed by Professor W. A. Cook. He reported also present-day practices, what teachers do while on leave and the effects of the leave upon their subsequent work.

RELATED TO THE ASSOCIATION AS A WHOLE. ** SOCIETY OF THE SIGMA XI. * AMERICAN NATURE STUDY SOCIETY. ** HONOR SOCIETY OF PHI KAPPA PHI. † GAMMA ALPHA GRADUATE SCIENTIFIC FRATERNITY. SIGMA DELTA EPSILON GRADUATE WOMEN'S SCIENTIFIC FRATERNITY

(Reports from Edward Ellery, Jennie Hall, Roy M. Peterson, H. R. Nelson and Kathryn Knowlton)

The thirty-second annual convention of the Society of the Sigma Xi was held in the Hotel Roosevelt, New Orleans, on December 29. Reports of the officers were received, and the following actions were taken: (1) That the executive committee be empowered to recognize in a suitable way research work done in institutions in which there is no chapter; (2) that the society do not place itself on record at the present time as favoring federal grants for research; (3) that chapters be established at Western Reserve University and at Princeton University; (4) that the following officers be elected: *President*, Louis B. Wilson, Mayo Foundation; *secretary*, Edward Ellery, Union College; *treasurer*, George B. Pegram, Columbia University; *member of executive committee* (for 5 years), H. V. Wilson, North Carolina; *member of executive committee* (to serve the unexpired portion of Dr. Louis Wilson's term), A. O. Leuschner, University of California; *alumni member of executive committee*, Henry G. McKnight, District of Columbia.

An innovation this year was the substitution of a buffet supper for the annual dinner. The supper followed the convention and gave opportunity for a discussion on the part of delegates of chapter affairs and the conduct of the society's business. The tenth annual lecture, under the joint auspices of the association and the society, was given in the Municipal

Auditorium by Mr. C. F. Hirshfeld, chief of research of the Detroit Edison Company (see General Sessions).

The meetings of the American Nature Study Society on Monday, Tuesday, Wednesday and Thursday offered a group of about seventy, who were in attendance, a most interesting and varied as well as profitable program.

The speakers of the Monday morning session, which was arranged by the New Orleans branch, described and illustrated the natural environs of New Orleans so vividly and so well that many of the audience were lured to nature in spite of excellent programs offered later in the week. On Tuesday morning the Webster Groves Branch, with fifteen papers, outlined the excellent group work accomplished in various fields included by that chapter of the society. Tuesday afternoon was given over to the study of nature and science in the schools of the country. Seven very able papers were given at this session and many valuable ideas were exchanged through discussion which followed the papers. Nine original contributions of various phases of natural history were given to the audience on Wednesday morning, when animated discussions arose which for a time threatened the postponement of a final business meeting.

On Tuesday evening the president, Mr. A. F. Satterthwait, of the U. S. Entomological Laboratory at Webster Groves, Missouri, presided over a banquet where a large group feasted and visited and where a few earnest members responded to toasts. During the program which followed the banquet, the newly organized New Orleans and New York branches were formally recognized by the society when their delegates were tendered bouquets of roses. The evening's entertainment was finally delightfully climaxed by Stanley C. Arthur's lecture and five-reel motion picture film, entitled "In Audubon's Louisiana." On Thursday morning the group was again entertained by the New Orleans branch, who conducted a tour to the beautiful school gardens of the city.

The business meeting on Monday afternoon was devoted to the adoption of a new constitution for the society and to other methods concerning better functioning of the organization. At this meeting it was voted to hold a meeting at Syracuse in June. Mr. Satterthwait was reelected president, Russell F. Lund, of the Connecticut Department of Education, was elected vice-president, and Jennie Hall, of Minneapolis, was continued as secretary-treasurer.

Before separating for personal interests and duties many members of the American Nature Study Society expressed the opinion that the twenty-fourth annual meeting had been a most happy and profitable one.

The twelfth biennial convention of the Honor Society of Phi Kappa Phi, which has chapters in forty-

five educational institutions, was held at the Bienville Hotel on December 28 and 29. The principal address was given by the retiring president general, Dr. Roswell G. Gibbs, of Cornell University. On the recommendation of the executive council it was voted to establish immediately two fellowships of the value of \$500 each, which will be available for advanced study to members of the society who graduate this year. Provision was made for building up a further endowment fund for fellowships, so that the number available will gradually increase, as well as a publications fund. The constitution was amended to provide for active life memberships. Officers were elected as follows: *President general*, Dr. Aven Nelson, University of Wyoming; *secretary general*, Dr. C. H. Gordon, University of Tennessee; *regent general*, Dr. E. C. Auchter, Bureau of Plant Industry, U. S. Department of Agriculture; *historian general*, Dr. J. S. Stevens, University of Maine; *editor general*, Dr. Roy M. Peterson, University of Maine.

The Gamma Alpha Graduate Scientific Fraternity held its annual council meeting and convention on Tuesday and Wednesday. The meeting of the council was largely devoted to considering policies of fraternity expansion. A method of raising funds for the payment of the councillors' transportation expenses to the annual meeting was devised and submitted to the chapters for ratification. This action was taken with a view to forming a closer bond between the various chapters and with the hope that the annual meetings will become a more effective means of exchanging ideas and transacting business. Forty members were present at the reunion breakfast on Wednesday morning. The officers for 1932 are: *President*, Rodney W. Babcock; *secretary*, H. R. Nelson; *treasurer*, S. P. Miller; *editor*, Carlton F. Scofield; *recorder*, D. S. Welch.

Sigma Delta Epsilon, graduate women's scientific fraternity, held two meetings. On Tuesday morning a breakfast was arranged at the Louisiana, to which all women interested in science were invited. Forty-five members and guests were present, representing about thirty-five institutions. Dr. Elinor H. Behre, of Louisiana State University, gave an interesting talk on the development of their summer biological work. The annual convention of this organization was held at the Orleans Club, following a second breakfast. Dr. Frances G. Wick gave a brief discussion of "Luminescence," mentioning some possible future developments in the field of lighting. The following national officers were elected for 1932: *President*, Erma A. Smith, Iowa State College; *vice-presidents*, Hazel Craig, Brown University, and Mande Bennot, Northwestern University; *secretary*, Agnes Zeimet, University of Wisconsin; *treasurer*, M. Helen Keith, University of Illinois.